NICE National Institute for Health and Care Excellence

NICE guideline

Tuberculosis

NICE guideline
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Your responsibility

The recommendations in this guideline represent the view of NICE, arrived at after careful consideration of the evidence available. When exercising their judgement, professionals and practitioners are expected to take this guideline fully into account, alongside the individual needs, preferences and values of their patients or the people using their service. It is not mandatory to apply the recommendations, and the guideline does not override the responsibility to make decisions appropriate to the circumstances of the individual, in consultation with them and their families and carers or guardian.

All problems (adverse events) related to a medicine or medical device used for treatment or in a procedure should be reported to the Medicines and Healthcare products Regulatory Agency using the Yellow Card Scheme.

Local commissioners and providers of healthcare have a responsibility to enable the guideline to be applied when individual professionals and people using services wish to use it. They should do so in the context of local and national priorities for funding and developing services, and in light of their duties to have due regard to the need to eliminate unlawful discrimination, to advance equality of opportunity and to reduce health inequalities. Nothing in this guideline should be interpreted in a way that would be inconsistent with complying with those duties.

Commissioners and providers have a responsibility to promote an environmentally sustainable health and care system and should assess and reduce the environmental impact of implementing NICE recommendations wherever possible.

Contents

This guideline replaces CG117 and PH37.

This guideline is the basis of QS141.

Overview

This guideline covers preventing, identifying and managing latent and active tuberculosis (TB) in children, young people and adults. It aims to improve ways of finding people who have TB in the community and recommends that everyone under 65 with latent TB should be treated. It describes how TB services should be organised, including the role of the TB control board.

Who is it for?

- Healthcare professionals and TB multidisciplinary teams
- Substance misuse services, prisons and immigration removal centres
- Local government and commissioners
- TB control boards, directors of public health and public health consultants
- Public Health England and NHS England
- Voluntary sector workers
- People with TB and their carers

Recommendations

People have the right to be involved in discussions and make informed decisions about their care, as described in making decisions about your care.

Making decisions using NICE guidelines explains how we use words to show the strength (or certainty) of our recommendations, and has information about prescribing medicines (including off-label use), professional guidelines, standards and laws (including on consent and mental capacity), and safeguarding.

1.1 Preventing TB

1.1.1 Raising and sustaining awareness of TB

Among health professionals and those working with high-risk groups

1.1.1.1 Multidisciplinary TB teams (in collaboration with Public Health England, primary care, the voluntary sector and Health Education England) should identify and support an ongoing TB education programme for local professionals in contact with the general public, and at-risk groups in particular. This includes, for example, staff in emergency departments, GPs and wider primary care staff, people who work in housing support services, staff who support migrants and those working in walk-in centres, hostels, substance misuse projects and prisons. **[2012, amended 2016]**

1.1.1.2 Multidisciplinary TB teams should ensure the education programme increases other professionals' awareness of the possibility of TB and reduces the stigma associated with it. The programme should include detail on:

- causes of TB, how it is transmitted, and the signs and symptoms
- lifestyle factors that may mask symptoms
- local epidemiology, highlighting under-served groups, other high-risk groups

and the fact that TB also occurs in people without risk factors

- principles of TB control:
  - early diagnosis and active case-finding
  - how to support treatment (including directly observed therapy)
  - drug resistance
  - awareness of drug interactions (including factors such as effect on contraception efficacy)
  - contact investigation after diagnosing an active case
  - the importance of adhering to treatment
  - treatment for TB is free for everyone (irrespective of eligibility for other NHS care)
  - social and cultural barriers to accessing health services (for example, fear of stigma and staff attitudes)
  - local referral pathways, including details of who to refer and how
  - the role of allied professionals in awareness-raising, identifying cases and helping people complete treatment
  - misinformation that causes fear about TB, including concerns about housing people with the condition
  - the best ways to effectively communicate all the above topics with different groups. **[2012, amended 2016]**

1.1.1.3 Statutory, community and voluntary organisations and advocates working with the general public, and under-served and high-risk groups in particular, should share information on TB education and awareness training with all frontline staff. (They should get information on this from the local multidisciplinary TB team.) **[2012, amended 2016]**

1.1.1.4 If possible, statutory, community and voluntary organisations should ensure

peers from under-served groups and anyone else with experience of TB contribute to, or lead, awareness-raising activities. (Peers who lead such activities will need training and support.) **[2012, amended 2016]**

Among high-risk groups

1.1.1.5 Multidisciplinary TB teams should help professionals working in relevant statutory, community and voluntary organisations to raise awareness of TB among under-served and other high-risk groups. These professionals should be able to explain that treatment for TB is free and confidential for everyone (irrespective of eligibility for other NHS care). They should also be able to provide people with details of:

- how to recognise symptoms in adults and children
- how people get TB
- the benefits of diagnosis and treatment (including the fact that TB is treatable and curable)
- location and opening hours of testing services
- referral pathways, including self-referral
- the potential interaction of TB medication with other drugs, for example, oral contraceptives and opioids (especially methadone) and HIV treatment
- TB/HIV co-infection
- how to address the myths about TB infection and treatment (for example, to counter the belief that TB is hereditary)
- how to address the stigma associated with TB
- the risk of migrants from high-incidence countries developing active TB, even if they have already screened negative for it
- contact tracing. **[2012, amended 2016]**

1.1.1.6 Multidisciplinary TB teams and others working with at-risk groups should use

high quality material to raise awareness of TB (see section 1.1.2). **[2012, amended 2016]**

1.1.1.7 Multidisciplinary TB teams and others working with the general public, and with under-served and other high-risk groups in particular, should include information on TB with other health-related messages and existing health promotion programmes tailored to the target group. **[2012, amended 2016]**

1.1.1.8 Multidisciplinary TB teams should work in partnership with voluntary organisations and 'community champions' to increase awareness of TB, in particular among under-served groups at risk of infection but also in the general population. If possible, peers who have experience of TB should contribute to awareness-raising activities and support people in treatment. **[2012, amended 2016]**

1.1.2 Providing information for the public about TB

1.1.2.1 National organisations (for example, National Knowledge Service: Tuberculosis, TB Alert, Public Health England, Department of Health and NHS Choices) should work together to develop generic, quality-assured template materials with consistent up-to-date messages. These materials should be made freely available and designed so that they can be adapted to local needs. **[new 2016]**

1.1.2.2 Multidisciplinary TB teams should use these templates for general awareness raising and targeted activities in under-served and other high-risk groups. Involve the target group in developing and piloting the materials. **[new 2016]**

1.1.2.3 The content of any materials should:

- be up-to-date and attractively designed, including pictures and colour if possible
- be culturally appropriate, taking into account the language, actions, customs, beliefs and values of the group they are aimed at
- be tailored to the target population's needs

- include risks and benefits of treatment, and how to access services, advice and support
- dispel myths
- show that, by deciding to be tested and treated for TB, a person can be empowered to take responsibility for their own health
- use language that encourages the person to believe that they can change their behaviour
- be simple and succinct. **[new 2016]**

1.1.2.4 Make the material available in a range of formats such as written, braille, text messages, electronic, audio (including podcasts), pictorial and video. Make them freely available in a variety of ways, for example, online, as print materials or on memory sticks. **[new 2016]**

1.1.2.5 Disseminate materials in ways likely to reach target groups, for example, via culturally specific radio or TV stations, at shelters, and at community, commercial or religious venues that target groups attend regularly. **[new 2016]**

1.1.3 BCG vaccination

1.1.3.1 To improve the uptake of BCG vaccination, identify eligible groups (in line with the Department of Health's Green Book) opportunistically through several routes, for example:

- new registrations in primary care and with antenatal services, or other points of contact with secondary or tertiary care
- people entering education, including university
- links with statutory and voluntary groups working with new entrants and looked-after children and young people
- during contact investigations. **[new 2016]**

1.1.3.2 When BCG vaccination is being recommended, discuss the benefits and risks of vaccination or remaining unvaccinated with the person (or, if a child, with the parents), so that they can make an informed decision. Tailor this discussion to the person, use appropriate language, and take into account cultural sensitivities and stigma. **[2006]**

1.1.3.3 If people identified for BCG vaccination through occupational health, contact tracing or new entrant screening are also considered to be at increased risk of being HIV-positive, offer them HIV testing before BCG vaccination. **[2006]**

BCG vaccination in neonates (0 to 4 weeks)

1.1.3.4 Identify babies eligible for vaccination (in line with the Green Book) before birth, ideally through antenatal services. **[new 2016]**

1.1.3.5 Discuss neonatal BCG vaccination for any baby at increased risk of TB with the parents or legal guardian. **[2006]**

1.1.3.6 Preferably vaccinate babies at increased risk of TB before discharge from hospital or before handover from midwifery to primary care. Otherwise, vaccinate as soon as possible afterwards, for example, at the 6-week postnatal check. **[new 2016]**

1.1.3.7 Incorporate computer reminders into maternity service (obstetrics) IT systems for staff, to identify and offer BCG vaccination to babies eligible for vaccination. **[new 2016]**

1.1.3.8 Provide education and training for postnatal ward staff, midwives, health visitors and other clinicians on identifying babies eligible for vaccination, local service information and providing BCG vaccination, including:

- case definition for at-risk groups to be offered vaccination
- information about the local BCG vaccination policy that can be given verbally, in writing or in any other appropriate format (see sections 1.1.1 and 1.1.2) to parents and carers at the routine examination of the baby before discharge

- local service information about BCG vaccination, such as pre-discharge availability of neonatal vaccination, local BCG clinics and referral for BCG vaccination if this is not available in maternity services
- administration of BCG vaccination and contraindications. **[new 2016]**

1.1.3.9 Primary care organisations with a high incidence of TB should consider vaccinating all neonates soon after birth. **[2006]**

1.1.3.10 In areas with a low incidence of TB (see Public Health England's TB rate bands, published in their annual tuberculosis report), primary care organisations should offer BCG vaccination to selected neonates who:

- were born in an area with a high incidence of TB **or**
- have 1 or more parents or grandparents who were born in a high-incidence country. **[2006, amended 2024]**

BCG vaccination for infants (0 to 5 years) and older children (6 to 15 years)

1.1.3.11 Routine BCG vaccination is not recommended for children aged 10 to 14 years.

- Healthcare professionals should opportunistically identify unvaccinated children older than 4 weeks and younger than 16 years at increased risk of TB who would have qualified for neonatal BCG (see recommendation 1.1.3.4) and provide Mantoux testing (see the section on diagnosing latent TB in children and young people) and BCG vaccination (if Mantoux-negative).

  At the time of publication (January 2016) the BNF states: 'The Mantoux test is recommended for tuberculin skin testing, but no licensed preparation is currently available.' For further guidance, see immunisation against infectious disease (the Green book).

- This opportunistic vaccination should be in line with the Green Book. **[2006, amended 2016]**

1.1.3.12 Mantoux testing should not be done routinely before BCG vaccination in children

younger than 6 years unless they have a history of residence or prolonged stay (more than 1 month) in a country with a high incidence of TB. **[2006]**

BCG vaccination for new entrants from high-incidence areas

1.1.3.13 Offer BCG vaccination to new entrants who are Mantoux-negative who:

- are from high-incidence countries **and**
- are previously unvaccinated (that is, without adequate documentation or a BCG scar) **and**
- are aged:
  - younger than 16 years **or**
  - 16 to 35 years from sub-Saharan Africa or a country with a TB incidence of 500 per 100,000 or more. **[2006, amended 2016]**

Encouraging uptake among infants, older children and new entrants

1.1.3.14 Deliver the following interventions in primary care settings to improve uptake of BCG vaccination in people from eligible groups (as outlined in the Green Book):

- education and support for practice staff, including:
  - raising awareness of relevant guidelines and case definition for at-risk groups
  - promoting BCG and TB testing in eligible groups
- incorporating reminders for staff (prompts about eligibility for BCG) on practice computers (for example, embedded in medical records)
- consider financial incentives for practices for identifying eligible groups for BCG and TB testing
- reminders ('immunisations due') and recall ('immunisations overdue') for people who are eligible for vaccination or for parents of infants and children

who are eligible, as outlined in the Green Book. (This could include written reminders, telephone calls from a member of staff or a computerised auto dialler, text messages or a combination of these approaches.) **[new 2016]**

1.1.3.15 Use home visits to give information and advice to people who are disadvantaged on the importance of immunisation. This should be delivered by trained lay health workers, community-based healthcare staff or nurses. **[new 2016]**

BCG vaccination for healthcare workers

1.1.3.16 Offer BCG vaccination to healthcare workers and other NHS employees as advised in the Green Book. **[2006, amended 2016]**

BCG vaccination for contacts of people with active TB

1.1.3.17 Offer BCG vaccination to Mantoux-negative contacts of people with pulmonary and laryngeal TB (see the section on diagnosing latent TB in all age groups) if they:

- have not been vaccinated previously (that is, there is no adequate documentation or a BCG scar) **and**
- are aged 35 years or younger **or**
- are aged 36 years and older and a healthcare or laboratory worker who has contact with patients or clinical materials. **[2006, amended 2016]**

BCG vaccination for other groups

1.1.3.18 Offer BCG vaccination to previously unvaccinated, Mantoux-negative people aged 35 years or younger in the following groups at increased risk of exposure to TB, in accordance with the Green Book:

- veterinary and other staff such as abattoir workers who handle animal species known to be susceptible to TB, such as simians

- prison staff working directly with prisoners
- staff of care homes for older people
- staff of hostels for people who are homeless and facilities accommodating refugees and asylum seekers
- people going to live or work with local people for more than 3 months in a high-incidence country. **[2006, amended 2016]**

1.1.4 Preventing infection in specific settings

Healthcare environments: new NHS employees

1.1.4.1 Employees new to the NHS who will be working with patients or clinical specimens should not start work until they have completed a TB screen or health check, or documentary evidence is provided of such screening having taken place within the preceding 12 months. **[2006]**

1.1.4.2 Employees new to the NHS who will not have contact with patients or clinical specimens should not start work if they have signs or symptoms of TB. **[2006]**

1.1.4.3 Health checks for employees new to the NHS who will have contact with patients or clinical materials should include:

- assessment of personal or family history of TB
- asking about symptoms and signs, possibly by questionnaire
- documentary evidence of TB skin (or interferon-gamma release assay) testing within the past 5 years and/or BCG scar check by an occupational health professional, not relying on the applicant's personal assessment. **[2006]**

1.1.4.4 See the section on healthcare workers for screening new NHS employees for latent TB. **[2006, amended 2011]**

1.1.4.5 Employees who will be working with patients or clinical specimens and who are Mantoux- or interferon-gamma release assay-negative (see section 1.2.1) should have an individual risk assessment for HIV infection before BCG vaccination is given. **[2006, amended 2016]**

1.1.4.6 Offer BCG vaccination to employees of any age who are new to the NHS and are from countries of high TB incidence, or who have had contact with patients in settings with a high TB prevalence, and who are Mantoux-negative. **[2006, amended 2011]**

1.1.4.7 If a new employee from the UK or other low-incidence setting, who has not had a BCG vaccination, has a positive Mantoux test and a positive interferon-gamma release assay, they should have a medical assessment and a chest X-ray. They should be referred to a TB clinic to determine whether they need TB treatment if the chest X-ray is abnormal, or to determine whether they need treatment of latent TB infection if the chest X-ray is normal. **[2006, amended 2011, amended 2016]**

1.1.4.8 If a prospective or current healthcare worker who is Mantoux-negative (see the section on healthcare workers) declines BCG vaccination, explain the risks and supplement the oral explanation with written advice. If the person still declines BCG vaccination, he or she should not work where there is a risk of exposure to TB. The employer will need to consider each case individually, taking account of employment and health and safety obligations. **[2006, amended 2016]**

1.1.4.9 Screen clinical students, agency and locum staff and contract ancillary workers who have contact with patients or clinical materials for TB to the same standard as new employees in healthcare environments, according to the recommendations set out above. Seek documentary evidence of screening to this standard from locum agencies and contractors who carry out their own screening. **[2006]**

1.1.4.10 NHS trusts arranging care for NHS patients in non-NHS settings should ensure that healthcare workers who have contact with patients or clinical materials in these settings have been screened for TB to the same standard as new employees in NHS settings. **[2006]**

Healthcare environments: occupational health

1.1.4.11 Include reminders of the symptoms of TB, and the need for prompt reporting of such symptoms, with annual reminders about occupational health for staff who:

- are in regular contact with TB patients or clinical materials **or**
- have worked in a high-risk clinical setting for 4 weeks or longer.

Give one-off reminders after a TB incident on a ward. **[2006]**

1.1.4.12 If no documentary evidence of previous screening is available, screen staff in contact with patients or clinical material who are transferring jobs within the NHS as for new employees (see recommendations 1.2.1.5 to 1.2.1.7 in the section on healthcare workers). **[2006]**

1.1.4.13 Assess the risk of TB for a new healthcare worker who knows he or she is HIV-positive at the time of recruitment as part of the occupational health checks. **[2006]**

1.1.4.14 The employer, through the occupational health department, should be aware of the settings with increased risk of exposure to TB, and that these pose increased risks to HIV-positive healthcare workers. **[2006]**

1.1.4.15 Healthcare workers who are found to be HIV-positive during employment should have medical and occupational assessments of TB risk, and may need to modify their work to reduce exposure. **[2006]**

1.2 Latent TB

1.2.1 Diagnosing latent TB in adults

1.2.1.1 Offer Mantoux testing to diagnose latent TB in adults aged 18 to 65 who are close contacts of a person with pulmonary or laryngeal TB.

- If the Mantoux test is inconclusive, refer the person to a TB specialist.

- If the Mantoux test is positive (an induration of 5 mm or larger, regardless of BCG history) assess for active TB (see the sections on diagnosing active TB in all age groups, diagnosing pulmonary (including laryngeal) TB in all age groups, diagnosing pulmonary (including laryngeal) TB in adults and diagnosing extrapulmonary TB in all age groups).

- If the Mantoux test is positive but a diagnosis of active TB is excluded, consider an interferon gamma release assay if more evidence of infection is needed to decide on treatment. This could be, for example, if the person needs enhanced case management or if there could be adverse events from treatment.

- If the Mantoux is positive, and if an IGRA was done and that is also positive, offer them treatment for latent TB infection (see the sections on managing latent TB in all age groups and managing latent TB in adults).

  At the time of publication (January 2016) the BNF states: 'The Mantoux test is recommended for tuberculin skin testing, but no licensed preparation is currently available.' For further guidance, see immunisation against infectious disease (the Green book).**[2011, amended 2016]**

Adults who are immunocompromised

1.2.1.2 In adults who are anticipated to be or are currently immunocompromised, do a risk assessment to establish whether testing should be offered, taking into account their:

- risk of progression to active TB based on how severely they are immunocompromised and for how long they have been immunocompromised

- risk factors for TB infection, such as country of birth or recent contact with an index case with suspected infectious or confirmed pulmonary or laryngeal TB. **[new 2016]**

1.2.1.3 For adults who are severely immunocompromised, such as those with HIV and CD4 counts of fewer than 200 cells/mm^3, or after solid organ or allogeneic stem cell transplant, offer an interferon-gamma release assay and a concurrent

Mantoux test.

- If either test is positive (for Mantoux, this is an induration of 5 mm or larger, regardless of BCG history), assess for active TB.
- If this assessment is negative, offer them treatment for latent TB infection. **[new 2016]**

1.2.1.4 For other adults who are immunocompromised, consider an interferon-gamma release assay alone or an interferon-gamma release assay with a concurrent Mantoux test.

- If either test is positive (for Mantoux, this is an induration of 5 mm or larger, regardless of BCG history), assess for active TB.
- If this assessment is negative, offer them treatment for latent TB infection. **[new 2016]**

Healthcare workers

1.2.1.5 Offer a Mantoux test to new NHS employees who will be in contact with patients or clinical materials, if the employees:

- are not new entrants from high-incidence countries **and**
- have not had BCG vaccination (for example, they are without a BCG scar, other documentation or a reliable history).

  If the Mantoux test is positive, offer an interferon-gamma release assay. If this is positive, assess for active TB; if this assessment is negative, offer them treatment for latent TB infection. **[2011, amended 2016]**

1.2.1.6 Offer a Mantoux test to new NHS employees who are from a high-incidence country.

- If the Mantoux test is positive (5 mm or larger, regardless of BCG history), assess for active TB; if this assessment is negative, offer them treatment for latent TB infection.

- If Mantoux testing is unavailable, offer an interferon-gamma release assay. **[new 2016]**

1.2.1.7 Offer an interferon-gamma release assay to new NHS employees who have had contact with patients in settings where TB is highly prevalent:

- If the interferon-gamma release assay is positive, assess for active TB **and**
- if this assessment is negative, offer them treatment for latent TB infection. **[2011, amended 2016]**

1.2.1.8 Healthcare workers who are immunocompromised should be screened in the same way as other people who are immunocompromised (see recommendations 1.2.1.2 to 1.2.1.4). **[2011]**

1.2.2 Diagnosing latent TB in children and young people

1.2.2.1 Only consider using interferon-gamma release assays alone in children and young people if Mantoux testing is not available or is impractical. This includes for example, situations in which large numbers need to be tested (see the section on incident and outbreak response and recommendation 1.2.3.2). **[new 2016]**

1.2.2.2 Refer children younger than 2 years and in close contact with people with smear-negative pulmonary or laryngeal TB to a specialist to determine what testing strategy for latent TB should be done. This should be a paediatrician with experience and training in TB, or a general paediatrician with advice from a specialised clinician. **[new 2016]**

1.2.2.3 If a neonate has been in close contact with people with smear-positive pulmonary or laryngeal TB who have not had at least 2 weeks of anti-TB treatment:

- Assess for active TB (see the sections on diagnosing active TB in all age groups, diagnosing pulmonary (including laryngeal) TB in all age groups and diagnosing pulmonary (including laryngeal) TB in children and young people).
- Start isoniazid (with pyridoxine).

- Carry out a Mantoux test after 6 weeks of treatment.
- If the Mantoux test is inconclusive, refer the child to a TB specialist.
- If the Mantoux test is positive (5 mm or larger, regardless of BCG history), reassess for active TB; if this assessment is negative, continue isoniazid (with pyridoxine) for a total of 6 months.
- If the Mantoux test is negative, reassess for active TB and consider an interferon-gamma release assay:
  - if the interferon-gamma release assay is negative then stop isoniazid (and pyridoxine) and give a BCG vaccination
  - if the interferon-gamma release assay is positive, reassess for active TB; if this assessment for active TB is negative, continue isoniazid (with pyridoxine) for a total of 6 months. **[new 2016]**

1.2.2.4 If a child aged between 4 weeks and 2 years has been in close contact with people with smear-positive pulmonary or laryngeal TB who have not had at least 2 weeks of anti-TB treatment:

- Assess for active TB.
- Start treatment for latent TB (see the sections on managing latent TB in all age groups and managing latent TB in children and young people) and carry out a Mantoux test.
- If the Mantoux test is inconclusive, refer the child to a TB specialist.
- If the Mantoux test is positive (5 mm or larger, regardless of BCG history), reassess for active TB; if this assessment is negative, complete treatment for latent TB.
- If the Mantoux test is negative, continue treatment for latent TB, reassess for active TB after 6 weeks and repeat the Mantoux test:
  - if the Mantoux test is negative, consider an interferon-gamma release assay
  - if the interferon-gamma release assay is negative, treatment for latent TB

may be stopped; give a BCG vaccination if the child has not already had one

- if either test is positive, reassess for active TB; if this assessment is negative, complete treatment for latent TB. **[new 2016]**

1.2.2.5 If a child or young person aged between 2 and 17 years has been in close contact with people with pulmonary or laryngeal TB:

- Offer Mantoux testing.
- If the Mantoux test is inconclusive, refer the child or young person to a TB specialist.
- If the Mantoux test is positive (5 mm or larger, regardless of BCG history), assess for active TB; if this assessment is negative, offer them treatment for latent TB infection.
- If the initial Mantoux test is negative, offer an interferon-gamma release assay after 6 weeks and repeat the Mantoux test. **[new 2016]**

Immunocompromised children and young people

1.2.2.6 If latent TB is suspected in children and young people who are anticipated to be or are currently immunocompromised (for example, if they are from a high incidence country or have been in close contact with people with suspected infectious or confirmed pulmonary or laryngeal TB), refer to a TB specialist. **[2016]**

1.2.3 Diagnosing latent TB in all age groups

New entrants from high-incidence countries

1.2.3.1 Offer Mantoux testing as the initial diagnostic test for latent TB infection in people who have recently arrived from a high-incidence country who present to healthcare services. If the Mantoux test is positive (5 mm or larger, regardless of

BCG history):

- assess for active TB (see recommendations 1.3.1 to 1.3.5 in the section on active TB) **and**
- if this assessment is negative, offer them treatment for latent TB infection (see the section on managing latent TB in all age groups to the section on managing latent TB in children and young people).

  If Mantoux testing is unavailable, offer an interferon-gamma release assay. **[new 2016]**

Contacts: incident situation

1.2.3.2 In an incident situation when large numbers of people may need to be screened, consider a single interferon-gamma release assay for people aged 18 to 65 years. For children and young people, follow the recommendations in the sections on diagnosing latent TB in children and young people and immunocompromised children and young people. **[2011, amended 2016]**

Under-served groups

1.2.3.3 Offer people younger than 65 years from under-served groups a single interferon-gamma release assay. **[2011, amended 2016]**

1.2.3.4 Substance misuse services with access to an interferon-gamma release assay should provide testing for people younger than 65 years who misuse substances if they:

- live in a high incidence area
- are likely to be involved with substance misuse services or other support services on a regular basis (for example, for opioid substitution therapy), when support should be available for directly observed preventive therapy. **[2012, amended 2016]**

1.2.3.5 In high incidence areas (and at prisons that receive prisoners from high incidence

areas), prison health services should offer an interferon-gamma release assay for TB to inmates younger than 65 years who are in regular contact with substance misuse services or other support services. This is provided arrangements have been made for this support to continue after release. **[2012, amended 2016]**

1.2.3.6 Substance misuse services and prison health services should incorporate interferon-gamma release assay testing with screening for hepatitis B and C, and HIV testing. They should refer prisoners and people who misuse substances with positive interferon-gamma release assays to local multidisciplinary TB teams for further clinical investigations. For prisoners, these investigations should be done in the prison if practically possible. **[2012, amended 2016]**

1.2.3.7 If the interferon-gamma release assay is positive, assess for active TB (see the sections on diagnosing active TB in all age groups to diagnosing extrapulmonary TB in all age groups); if this assessment is negative, offer them treatment for latent TB infection (see sections on managing latent TB in all age groups to managing latent TB in children and young people). **[new 2016]**

1.2.4 Managing latent TB in all age groups

1.2.4.1 Be aware that certain groups of people with latent TB are at increased risk of going on to develop active TB, including people who:

- are HIV-positive
- are younger than 5 years
- have excessive alcohol intake
- are injecting drug users
- have had solid organ transplantation
- have a haematological malignancy
- are having chemotherapy
- have had a jejunoileal bypass

- have diabetes
- have chronic kidney disease or receive haemodialysis
- have had a gastrectomy
- are having treatment with anti-tumour necrosis factor-alpha or other biologic agents
- have silicosis. **[new 2016]**

1.2.4.2 For people, including those with HIV, aged younger than 65 years with evidence of latent TB who have been in close contact with people who have suspected infectious or confirmed active pulmonary or laryngeal drug-sensitive TB, offer either of the following drug treatments:

- 3 months of isoniazid (with pyridoxine) and rifampicin **or**
- 6 months of isoniazid (with pyridoxine). **[new 2016]**

1.2.4.3 Base the choice of regimen on the person's clinical circumstances. Offer:

- 3 months of isoniazid (with pyridoxine) and rifampicin to people younger than 35 years if hepatotoxicity is a concern after an assessment of both liver function (including transaminase levels) and risk factors
- 6 months of isoniazid (with pyridoxine) if interactions with rifamycins are a concern, for example, in people with HIV or who have had a transplant. **[new 2016]**

1.2.4.4 Clearly explain the risks and potential benefits of each treatment regimen. In discussion with the person, select a suitable regimen if they wish to proceed with preventive treatment. **[new 2016]**

1.2.4.5 If a person also has severe liver disease, for example, Child-Pugh level B or C, work with a specialist multidisciplinary team with experience of managing TB and liver disease. **[new 2016]**

1.2.4.6 Manage treatment with caution, ensuring careful monitoring of liver function, in:

- people with non-severe liver disease
- people with abnormal liver function (including abnormal transaminase levels) before starting treatment for latent TB infection
- people who misuse alcohol or drugs. **[new 2016]**

1.2.4.7 Ensure people having treatment for latent TB who also have social risk factors, such as misusing alcohol or drugs or being homeless, are linked to support services. They should also have an assessment of social needs and stability, including potential barriers to adherence or treatment completion (see the section on adherence, treatment completion and follow-up). **[new 2016]**

1.2.4.8 People in the groups listed in recommendation 1.2.4.1 who do not have treatment for latent TB, as specified in recommendations 1.2.4.2 to 1.2.4.8, for any reason should be advised of the risks and symptoms of TB (on the basis of an individual risk assessment), usually in a standard letter of the type referred to as 'Inform and advise' information (see section 1.1.2). **[new 2016]**

1.2.5 Managing latent TB in adults

1.2.5.1 For adults between the ages of 35 and 65 years, offer drug treatments only if hepatotoxicity is not a concern. **[new 2016]**

1.2.5.2 Offer testing for HIV before starting treatment for latent TB. See the NICE guidelines on increasing the uptake of HIV testing among black Africans in England and increasing the uptake of HIV testing among men who have sex with men. **[new 2016]**

1.2.5.3 Offer adults testing for hepatitis B and C before starting treatment for latent TB. See the NICE guidelines on hepatitis B and C: ways to promote and offer testing to people at increased risk of infection and hepatitis B (chronic): diagnosis and management of chronic hepatitis B in children, young people and adults. **[new 2016]**

1.2.6 Managing latent TB in children and young people

1.2.6.1 Consider testing children and young people for hepatitis B and C before starting treatment for latent TB. See the NICE guidelines on hepatitis B and C: ways to promote and offer testing to people at increased risk of infection and hepatitis B (chronic): diagnosis and management of chronic hepatitis B in children, young people and adults. **[new 2016]**

1.3 Active TB

1.3.1 Diagnosing active TB in all age groups

1.3.1.1 If TB is a possibility, microbiology staff should consider carrying out TB culture on samples (see recommendations 1.3.2.2 and 1.3.2.3), even if it is not requested. **[2006, amended 2016]**

1.3.1.2 If there are clinical signs and symptoms consistent with a diagnosis of TB, start treatment without waiting for culture results. **[2006]**

1.3.1.3 Consider completing the standard recommended regimen (see recommendations 1.3.7.2 and 1.3.7.3 in the section on standard treatment), even if subsequent culture results are negative. **[2006, amended 2016]**

1.3.2 Diagnosing pulmonary (including laryngeal) TB in all age groups

1.3.2.1 Take a chest X-ray; do further diagnostic investigations (as detailed below and summarised in table 1) if chest X-ray appearances suggest TB. **[2016]**

1.3.2.2 Send multiple respiratory samples (3 deep cough sputum samples, preferably including 1 early morning sample) for TB microscopy and culture. **[2016]**

- This should be before starting treatment if possible or, failing that, within 7 days of starting treatment in people with life-threatening disease. **[2006,**

amended 2016]

- Obtain spontaneously-produced, deep cough sputum samples if possible, otherwise use:
  - 3 gastric lavages or 3 inductions of sputum in children and young people (see recommendation 1.5.1.10 in the section on infection control in healthcare settings) **[new 2016] or**
  - induction of sputum or bronchoscopy and lavage in adults. **[2006, amended 2016]**
- Laboratory practices should be in accordance with the UK's Standards for Microbiology Investigations. **[new 2016]**

1.3.2.3 Send samples for TB culture from autopsy samples if pulmonary or laryngeal TB is a possibility. **[2006, amended 2016]**

1.3.3 Diagnosing pulmonary (including laryngeal) TB in adults

1.3.3.1 Request rapid diagnostic nucleic acid amplification tests for the *M. tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum*) on primary specimens (listed in table 1) if there is clinical suspicion of TB disease, and:

- the person has HIV **or**
- rapid information about mycobacterial species would alter the person's care **or**
- the need for a large contact-tracing initiative is being explored. **[new 2016]**

1.3.4 Diagnosing pulmonary (including laryngeal) TB in children and young people

1.3.4.1 In children aged 15 years or younger with suspected pulmonary TB, offer rapid diagnostic nucleic acid amplification tests for the *M. tuberculosis* complex (*M. tuberculosis*, *M. bovis*, *M. africanum*). Usually only 1 nucleic acid amplification

test is needed per specimen type (for example, spontaneous sputum, induced sputum or gastric lavage; see table 1). **[new 2016]**

1.3.4.2 In young people aged 16 to 18 years use the same criteria as in adults to decide whether to request rapid diagnostic nucleic acid amplification tests (see table 1). **[new 2016]**

Table 1 Diagnostic investigations for pulmonary TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests (if it would alter management)
Pulmonary (adult)	X-ray (Routine test, see recommendation 1.3.2.1.) CT thorax Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	3 respiratory samples: • preferably spontaneously-produced, deep cough sputum samples, otherwise induced sputum or bronchoscopy and lavage • preferably 1 early morning sample	Microscopy Culture Histology	Nucleic acid amplification test

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests (if it would alter management)
Pulmonary (young people aged 16 to 17 years)	X-ray (Routine test, see recommendation 1.3.2.1.) CT thorax Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	3 respiratory samples: • preferably spontaneously-produced, deep cough sputum samples, otherwise induced sputum or gastric lavage • preferably 1 early morning sample	Microscopy Culture Histology	Nucleic acid amplification test
Pulmonary (children aged 15 years or younger)	X-ray (Routine test, see recommendation 1.3.2.1.) CT thorax Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	3 respiratory samples: • preferably spontaneously-produced, deep cough sputum samples, otherwise induced sputum or gastric lavage • preferably 1 early morning sample	Microscopy Culture Histology Nucleic acid amplification tests (1 per specimen type)	Interferon-gamma release assay and/or tuberculin skin test (with expert input)

1.3.4.3 Either a paediatrician with experience and training in TB or a general paediatrician

with advice from a specialised clinician should investigate and manage TB in children and young people. **[new 2016]**

1.3.4.4 An expert in paediatric TB may request interferon-gamma release assays and tuberculin skin tests. Interpret these together with other diagnostic tools (such as history taking, clinical examination and imaging). **[new 2016]**

1.3.5 Diagnosing extrapulmonary TB in all age groups

1.3.5.1 Discuss the advantages and disadvantages of both biopsy and needle aspiration with the patient, with the aim of obtaining adequate material for diagnosis. **[2006]**

1.3.5.2 Do not place part or all of any of the samples in formalin (or other fixative agent) when sending for TB culture. **[2006, amended 2016]**

1.3.5.3 Think about a diagnosis of extrapulmonary TB even if rapid diagnostic tests in, for example, cerebrospinal fluid, pleural fluid or ascitic fluid are negative. **[new 2016]**

1.3.5.4 Offer all patients presenting with extrapulmonary TB a chest X-ray and, if possible, culture of a spontaneously-produced respiratory sample to exclude or confirm coexisting pulmonary TB (see recommendations 1.3.1 to 1.3.3 in the section on active TB). Also, consider site-specific tests as described below to exclude or confirm additional sites of TB. **[new 2016]**

1.3.5.5 Refer to an expert for sites not listed here, including TB of the eye and other rare sites of disease. **[new 2016]**

Pleural TB

1.3.5.6 Use the site-specific investigations listed in table 2 to diagnose and assess pleural TB.

Table 2 Site-specific investigations for pleural TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Pleural	X-ray Bronchoscopy Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	3 respiratory samples: • preferably spontaneously-produced, deep cough sputum samples, otherwise induced sputum or gastric lavage • preferably 1 early morning sample Pleural biopsy	Microscopy Culture Histology	-
Pleural	X-ray Bronchoscopy Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Pleural fluid	Microscopy Culture Cytology	Adenosine deaminase assay

[new 2016]

Central nervous system TB

1.3.5.7 Use the site-specific investigations listed in table 3 to diagnose and assess central nervous system TB.

Table 3 Site-specific investigations for central nervous system TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Central nervous system	CT (Routine test, see recommendation 1.3.5.8) MRI (Routine test, see recommendation 1.3.5.8) Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Biopsy of suspected tuberculoma	Microscopy Culture Histology	-
Central nervous system	CT (Routine test, see recommendation 1.3.5.8) MRI (Routine test, see recommendation 1.3.5.8) Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Cerebrospinal fluid	Microscopy Culture Cytology	Adenosine deaminase assay
Meningeal	CT (Routine test, see recommendation 1.3.5.8) MRI (Routine test, see recommendation 1.3.5.8) Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Cerebrospinal fluid	Microscopy Culture Cytology	Nucleic acid amplification test Adenosine deaminase assay

[new 2016]

1.3.5.8 Offer a CT or MRI scan to people in whom central nervous system involvement is

suspected. **[2016]**

1.3.5.9 Offer treatment for TB meningitis if clinical signs and other laboratory findings are consistent with the diagnosis, even if a rapid diagnostic test is negative. **[new 2016]**

Lymph node TB (including intrathoracic mediastinal adenopathy)

1.3.5.10 Use the site-specific investigations listed in table 4 to diagnose and assess lymph node TB (including intrathoracic mediastinal adenopathy).

Table 4 Site-specific investigations for lymph node TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Lymph node (including intrathoracic mediastinal adenopathy)	Ultrasound CT MRI Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Biopsy	Microscopy Culture Histology	Nucleic acid amplification test
Lymph node (including intrathoracic mediastinal adenopathy)	Ultrasound CT MRI Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Aspirate	Microscopy Culture Cytology	Nucleic acid amplification test

[new 2016]

Pericardial TB

1.3.5.11 Use the site-specific investigations listed in table 5 to diagnose and assess pericardial TB.

Table 5 Site-specific investigations for pericardial TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Pericardial	Echocardiogram Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Biopsy of pericardium	Microscopy Culture Histology	-
Pericardial	Echocardiogram Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Pericardial fluid	Microscopy Culture Cytology	Nucleic acid amplification test Adenosine deaminase assay

[new 2016]

Gastrointestinal TB

1.3.5.12 Use the site-specific investigations listed in table 6 to diagnose and assess gastrointestinal TB.

Table 6 Site-specific investigations for gastrointestinal TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Gastrointestinal	Ultrasound CT Laparoscopy Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Biopsy of omentum Biopsy of bowel Biopsy of liver	Microscopy Culture Histology	-
Gastrointestinal	Ultrasound CT Laparoscopy Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Ascitic fluid	Microscopy Culture Cytology	Adenosine deaminase assay

[new 2016]

Genitourinary TB

1.3.5.13 Use the site-specific investigations listed in table 7 to diagnose and assess genitourinary TB.

Table 7 Site-specific investigations for genitourinary TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Genitourinary	Ultrasound Intravenous urography Laparoscopy Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Early morning urine	Culture	-
Genitourinary	Ultrasound Intravenous urography Laparoscopy Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Biopsy from site of disease, such as endometrial curettings or renal biopsy	Microscopy Culture Histology	-

[new 2016]

Bone and joint TB

1.3.5.14 Use the site-specific investigations listed in table 8 to diagnose and assess bone and joint TB.

Table 8 Site-specific investigations for bone and joint TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional test on primary specimen (if it would alter management)
Bone or joint TB	X-ray CT MRI Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment	Biopsy or aspirate of paraspinal abscess Biopsy of joint Aspiration of joint fluid	Culture	-

[new 2016]

Disseminated TB

1.3.5.15 Use the site-specific investigations listed in table 9 to diagnose and assess disseminated TB.

Table 9 Site-specific investigations for disseminated TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Disseminated	CT of the thorax and head MRI Ultrasound of the abdomen Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Biopsy of site of disease, including lung, liver and bone marrow	Microscopy Culture Histology	Additional tests appropriate to site

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Disseminated	CT of the thorax and head MRI Ultrasound of the abdomen Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Aspirate bone marrow Bronchial wash Cerebrospinal fluid	Microscopy (if sample available) Culture Cytology	Additional tests appropriate to site
Disseminated	CT of the thorax and head MRI Ultrasound of the abdomen Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment.	Blood	Culture	Additional tests appropriate to site

[new 2016]

Skin TB

1.3.5.16 Use the site-specific investigations listed in table 10 to diagnose and assess skin TB.

Table 10: Site-specific investigations for skin TB

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Skin	-	Biopsy	Microscopy Culture Histology	-

[2016]

Localised tuberculous abscess

1.3.5.17 Use the site-specific investigations listed in table 11 to diagnose and assess TB in a localised, tuberculous abscess at a site other than a lymph node.

Table 11: Site-specific investigations for localised tuberculous abscess

Suspected site of disease	Possible imaging techniques	Specimen	Routine test	Additional tests on primary specimen (if it would alter management)
Abscess outside of the lymph nodes	Ultrasound or other appropriate imaging Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment	Aspirate	Microscopy Culture Cytology	-
Abscess outside of the lymph nodes	Ultrasound or other appropriate imaging Taking into account, for example, the exact site of suspected disease and the availability of the test at the time of assessment	Biopsy	Microscopy Culture Histology	-

[2016]

1.3.6 Rapid-access radiology and other investigation results: referral to multidisciplinary TB team process

1.3.6.1 Local hospitals, clinical commissioning groups and the local multidisciplinary team should consider developing a local pathway for people with imaging highly suggestive of active TB. The pathway should enable them to be referred by the radiology department by the next working day to multidisciplinary TB teams. Consider including the following in the pathway:

- Agreed standardised radiology codes to identify imaging investigations highly suggestive of active TB.
- Regular liaison between multidisciplinary TB teams and the radiology department (for example, weekly) to ensure all patients have been referred to the multidisciplinary team for triage using the agreed local mechanism or pathway. **[new 2016]**

1.3.6.2 Report results of all pathology or other diagnostic results suggesting TB to the multidisciplinary TB team and clinicians who ask for them. **[new 2016]**

Direct referral from emergency departments to multidisciplinary TB teams

1.3.6.3 Commissioners and multidisciplinary teams should consider working with emergency departments to develop direct referral pathways for people with suspected active TB so that:

- the local multidisciplinary team is informed of all suspected cases of TB using the appropriate process
- referral is accepted from any appropriate healthcare professional, for example an on-call radiologist. **[new 2016]**

1.3.6.4 Emergency department clinicians should ensure first-line diagnostic tests for TB are performed on anyone presenting with suspected TB (see table 1 on diagnostic investigations for pulmonary TB). **[new 2016]**

1.3.6.5 Emergency departments should consider carrying out audits of their direct referrals because of suspected active TB and the outcomes of diagnosis. **[new 2016]**

1.3.6.6 Multidisciplinary TB teams should consider training emergency department staff in:

- using approaches that do not stigmatise people with TB
- giving people with TB appropriate advice (see recommendations 1.1.1 and 1.1.2

in the section on raising and sustaining awareness of TB and the section on infection control). **[new 2016]**

1.3.7 Managing active TB in all age groups

Standard treatment

1.3.7.1 Once a diagnosis of active TB is made:

- the clinician responsible for care should refer the person with TB to a clinician with training in, and experience of, the specialised care of people with TB
- the TB service should include specialised nurses and health visitors
- active TB in children should be managed by a TB specialist (see recommendation 1.3.4.3 in the section on diagnosing pulmonary (including laryngeal) TB in children and young people), and by paediatric trained nursing staff, where possible.

  If these arrangements are not possible, seek advice from more specialised colleagues throughout the treatment period. **[2016]**

1.3.7.2 For people with active TB without central nervous system involvement, offer:

- isoniazid (with pyridoxine), rifampicin, pyrazinamide and ethambutol for 2 months **then**
- isoniazid (with pyridoxine) and rifampicin for a further 4 months.

  Modify the treatment regimen according to drug susceptibility testing. **[2016]**

1.3.7.3 For people with active TB of the central nervous system, offer:

- isoniazid (with pyridoxine), rifampicin, pyrazinamide and ethambutol for 2 months **then**
- isoniazid (with pyridoxine) and rifampicin for a further 10 months.

Modify the treatment regimen according to drug susceptibility testing. **[2016]**

1.3.7.4 Test people with active spinal TB who have neurological signs or symptoms for central nervous system involvement (see recommendation 1.3.5.8 in the section on central nervous system TB). Manage direct spinal cord involvement (for example, a spinal cord tuberculoma) as TB of the central nervous system. **[2016]**

1.3.7.5 For people with active spinal TB without central nervous system involvement, do not extend treatment beyond 6 months for residual effects (for example, persistent bending of the spine or vertebral loss). **[2016]**

1.3.7.6 Test people with disseminated (including miliary) TB who have neurological signs or symptoms for central nervous system involvement. If there is evidence of central nervous system involvement, treat as for TB of the central nervous system. **[2016]**

1.3.7.7 Treat active peripheral lymph node TB in people who have had an affected gland surgically removed with the standard recommended regimen. **[new 2016]**

1.3.7.8 For people with active TB of the lymph nodes, do not routinely extend treatment beyond 6 months for newly enlarged lymph nodes or sinus formation, or for residual enlargement of the lymph nodes or sinuses. **[new 2016]**

Dosing of regimens

1.3.7.9 Use fixed-dose combination tablets as part of any TB treatment regimen. **[2006]**

1.3.7.10 Do not offer anti-TB treatment dosing regimens of fewer than 3 times per week. **[2006, amended 2016]**

1.3.7.11 Offer a daily dosing schedule to people with active pulmonary TB. **[2006, amended 2016]**

1.3.7.12 Consider a daily dosing schedule as first choice in people with active extrapulmonary TB. **[2006, amended 2016]**

1.3.7.13 Consider 3 times weekly dosing for people with active TB only if:

- a risk assessment identifies a need for directly observed therapy and enhanced case management (see section on adherence, treatment completion and follow-up) **and**
- daily directly observed therapy is not possible. **[2006, amended 2016]**

People with comorbidities or coexisting conditions

1.3.7.14 If the person has a comorbidity or coexisting condition such as:

- HIV **or**
- severe liver disease, for example, Child-Pugh level B or C **or**
- stage 4 or 5 chronic kidney disease (a glomerular filtration rate of <30 ml/minute/1.73m^2) **or**
- diabetes **or**
- eye disease or impaired vision **or**
- pregnancy or breastfeeding **or**
- a history of alcohol or substance misuse

work with a specialist multidisciplinary team with experience of managing TB and the comorbidity or coexisting condition. **[new 2016]**

1.3.7.15 For people with HIV and active TB without central nervous system involvement, do not routinely extend treatment beyond 6 months. **[new 2016]**

1.3.7.16 For people with HIV and active TB with central nervous system involvement, do not routinely extend treatment beyond 12 months. **[new 2016]**

1.3.7.17 Take into account drug-to-drug interactions when co-prescribing antiretroviral and anti-TB drugs. **[new 2016]**

Adjunctive corticosteroids

Central nervous system TB

1.3.7.18 At the start of an anti-TB treatment regimen, offer people with active TB of the central nervous system dexamethasone or prednisolone, initially at a high dose with gradual withdrawal over 4 to 8 weeks. An example of a suitable regimen is listed in table 12.

Table 12 Example of suitable corticosteroid regimen for adults

Dose of dexamethasone by week	Stage 1	Stage 2 or 3
Week 1	0.3 mg/kg/day (intravenous)	0.4 mg/kg/day (intravenous)
Week 2	0.2 mg/kg/day (intravenous)	0.3 mg/kg/day (intravenous)
Week 3	0.1 mg/kg/day (oral)	0.2 mg/kg/day (intravenous)
Week 4	3 mg/day (oral)	0.1 mg/kg/day (intravenous)
Week 5	2 mg/day (oral)	4 mg/day (oral)
Week 6	1 mg/day (oral)	3 mg/day (oral)
Week 7	-	2 mg/day (oral)
Week 8	-	1 mg/day (oral)

According to the modified British Medical Research Council criteria for disease severity:

Stage 1: Glasgow coma score of 15 without focal neurological deficits; alert and oriented.

Stage 2: Glasgow coma score of 14 to 11 or 15 with focal neurological deficits.

Stage 3: Glasgow coma score of 10 or less, with or without focal neurological deficits.

[new 2016]

1.3.7.19 At the start of an anti-TB treatment regimen, offer children and young people with active TB of the central nervous system dexamethasone or prednisolone. This should initially be at a high dose with gradual withdrawal over 4 to 8 weeks in line

with the British National Formulary for Children. **[new 2016]**

Pericardial TB

1.3.7.20 At the start of an anti-TB treatment regimen, offer adults with active pericardial TB oral prednisolone at a starting dose of 60 mg/day, gradually withdrawing it 2 to 3 weeks after starting treatment. **[2016]**

1.3.7.21 At the start of an anti-TB treatment regimen, offer children and young people with active pericardial TB oral prednisolone in line with the British National Formulary for Children. Gradually withdraw prednisolone 2 to 3 weeks after starting treatment. **[2016]**

Adjunctive surgery

1.3.7.22 If surgery is indicated, the surgeon should fully explain what is involved to the person, either with or after consulting a TB specialist. Discuss the possible benefits and risks with the person and their family members or carers, as appropriate, so that they can make an informed decision. **[new 2016]**

Central nervous system TB

1.3.7.23 Consider referring people with TB of the central nervous system for surgery as a therapeutic intervention only if there is evidence of raised intracranial pressure. **[new 2016]**

Spinal TB

1.3.7.24 Do not routinely refer people with spinal TB for surgery to eradicate the disease. **[new 2016]**

1.3.7.25 Consider referring people with spinal TB for surgery if there is spinal instability or evidence of spinal cord compression. **[new 2016]**

1.4 Drug resistant TB

1.4.1 Multidrug-resistant TB

1.4.1.1 For people with clinically suspected TB, a TB specialist should request rapid diagnostic nucleic acid amplification tests for rifampicin resistance on primary specimens if a risk assessment for multidrug resistance identifies any of the following risk factors:

- history of previous TB drug treatment, particularly if there was known to be poor adherence to that treatment
- contact with a known case of multidrug-resistant TB
- birth or residence in a country in which the World Health Organization reports that a high proportion (5% or more) of new TB cases are multidrug-resistant.

Start infection control measures (see section 1.5). **[new 2016]**

1.4.1.2 If the rapid diagnostic nucleic acid amplification test for rifampicin resistance is positive:

- continue infection control measures until pulmonary or laryngeal disease has been excluded
- manage treatment along with a multidisciplinary team with experience of managing multidrug-resistant TB (see the section on service organisation)
- offer a treatment regimen involving at least 6 drugs to which the mycobacterium is likely to be sensitive
- test for resistance to second-line drugs. **[new 2016]**

1.4.1.3 If the rapid diagnostic nucleic acid amplification test for the *M. tuberculosis* complex is positive but rifampicin resistance is not detected, treat as drug-susceptible TB with the standard regimen (see the section on managing active TB in all age groups). **[new 2016]**

1.4.1.4 If the rapid diagnostic nucleic acid amplification test for the *M. tuberculosis*

complex is negative in a person at high risk of multidrug-resistant TB:

- obtain further specimens for nucleic acid amplification testing and culture, if possible
- use rapid rifampicin resistance detection on cultures that become positive for the *M. tuberculosis* complex
- consider waiting for the results of further tests before starting treatment if the person is well
- if urgent treatment is needed, consider managing as multidrug-resistant TB until sensitivity results are available. **[new 2016]**

1.4.1.5 When definitive phenotypic susceptibility results are available, modify treatment as needed (see sections on managing active TB in all age groups and drug-resistant TB). **[new 2016]**

1.4.1.6 Consider more intensive clinical follow-up for people with multidrug-resistant TB. This includes people having directly observed therapy (see the section on adherence, treatment completion and follow-up) throughout treatment because of the complexity of treatment and risk of adverse events. **[new 2016]**

1.4.1.7 Discuss the options for organising care for people with multidrug-resistant TB with clinicians who specialise in this. Seek the person's views and take them into account, and consider shared care (see the section on service organisation). **[2006]**

1.4.1.8 Consider surgery as a therapeutic intervention in people with potentially resectable multidrug-resistant disease if:

- optimal medical therapy under direct observation has not worked **or**
- medical therapy is likely to fail because of extensively drug-resistant TB. **[new 2016]**

1.4.2 Drug-resistant TB (excluding multidrug- and extensively drug-resistant TB)

1.4.2.1 For people with TB, without central nervous system involvement, that is resistant to just 1 drug consider the treatments in table 13.

Table 13 Treatment regimen for people with TB that is resistant to 1 drug

Drug resistance	First 2 months (initial phase)	Continue with (continuation phase)
Isoniazid	Rifampicin, pyrazinamide and ethambutol	Rifampicin and ethambutol for 7 months (up to 10 months for extensive disease)
Pyrazinamide	Rifampicin, isoniazid (with pyridoxine) and ethambutol	Rifampicin and isoniazid (with pyridoxine) for 7 months
Ethambutol	Rifampicin, isoniazid (with pyridoxine) and pyrazinamide	Rifampicin and isoniazid (with pyridoxine) for 4 months
Rifampicin	As for multidrug-resistant TB	As for multidrug-resistant TB

[new 2016]

1.4.2.2 For people with drug-resistant TB and central nervous system involvement, involve a TB specialist with experience in managing drug-resistant TB in decisions about the most appropriate regimen and the duration of treatment. **[new 2016]**

1.5 Infection control

NICE has also produced general guidelines on the prevention and control of healthcare-associated infections in primary and community care, and the prevention and control of healthcare-associated infections.

1.5.1 Healthcare settings

1.5.1.1 Ensure healthcare settings can promptly identify people with suspected

infectious or confirmed pulmonary or laryngeal TB before or at presentation. Ensure people working in the settings follow the recommendations about testing and treatments (see the sections on latent TB, active TB and drug resistant TB*)*. **[new 2016]**

1.5.1.2 Put people with suspected infectious or confirmed pulmonary or laryngeal TB who will remain in a hospital setting (including emergency, outpatients or inpatient care) in a single room. If this is not possible, keep the person's waiting times to a minimum. This may involve prioritising their care above that of other patients. **[new 2016]**

1.5.1.3 Minimise the number and duration of visits a person with TB makes to an outpatient department while they are still infectious. To minimise the risk of infection, people with infectious TB should be seen at times or in places away from other people. **[new 2016]**

1.5.1.4 In hospital settings, risk assess people with suspected infectious or confirmed pulmonary TB for multidrug-resistant TB *(*see the section on multidrug-resistant TB). Care for people deemed to be at low risk in a single room, as a minimum. For people deemed to be at high risk:

- provide care in a negative pressure room **and**
- have specimens sent for rapid diagnostic tests, such as nucleic acid amplification tests. **[new 2016]**

1.5.1.5 Unless there is a clear clinical or public health need, such as homelessness, people with suspected infectious or confirmed pulmonary TB should not be admitted to hospital for diagnostic tests or for care. **[2006, amended 2016]**

1.5.1.6 Do not admit people with suspected infectious or confirmed pulmonary TB to a ward containing people who are immunocompromised, such as transplant recipients, people with HIV and those on anti-tumour necrosis factor alpha or other biologics, unless they can be cared for in a negative pressure room on the same ward. **[new 2016]**

1.5.1.7 Assess any visitors to a child with suspected active TB in hospital for symptoms of infectious TB, and keep them separate from other people until they have been

excluded as a source of infection (see recommendations 1.2.1 to 1.2.3 in the section on latent TB and the section on contact tracing). **[new 2016]**

1.5.1.8 Care for people with a continuing clinical or public health need for admission with pulmonary TB in a single room (as a minimum) until they have completed 2 weeks of the standard treatment regimen (see the section on managing active TB in all age groups) if they:

- are unlikely to be rifampicin resistant (that is, do not have risk factors for multidrug-resistant TB) **or**
- have negative rifampicin resistance on nucleic acid amplification test or culture. **[new 2016]**

1.5.1.9 Consider de-escalating isolation after 2 weeks of treatment, taking into account the risks and benefits, if:

- the person is showing tolerance to the prescribed treatment
- there is agreement to adhere to treatment
- there is resolution of cough
- there is definite clinical improvement on treatment; for example, remaining afebrile for a week
- there are not immunocompromised people, such as transplant recipients, people with HIV and those on anti-tumour necrosis factor alpha or other biologics, in the same accommodation
- the person's initial smear grade was not high; for example, 2 or less
- there is not extensive pulmonary involvement, including cavitation
- there is no laryngeal TB. **[new 2016]**

1.5.1.10 In people who may have TB, only carry out aerosol-generating procedures such as bronchoscopy, sputum induction or nebuliser treatment in an appropriately engineered and ventilated area (ideally a negative pressure room). **[new 2016]**

1.5.1.11 Consider discharging from hospital people:

- who do not have a continuing clinical or public health need for admission with pulmonary TB **and**
- who are unlikely to be rifampicin resistant (that is, do not have risk factors for multidrug-resistant TB) **or**
- who have negative rifampicin resistance on nucleic acid amplification test or culture.

If discharged, the person should avoid congregate settings for the first 2 weeks of their treatment. **[new 2016]**

1.5.1.12 Explain to inpatients with suspected infectious or confirmed pulmonary or laryngeal TB that they will need to wear a surgical mask in the hospital whenever they leave their room. Ask them to continue wearing it until they have had at least 2 weeks of treatment. **[2016]**

1.5.1.13 Offer people advice on simple respiratory hygiene measures. **[new 2016]**

1.5.2 Non-healthcare settings

1.5.2.1 In non-healthcare settings catering for large numbers of people and populations at high risk of TB (such as detention settings, residential hostels and day centres):

- promote simple respiratory hygiene
- ensure awareness of symptoms of potentially infectious TB to enable prompt healthcare referral
- work with the local public health team and the local authority to ensure accommodation for people with TB
- ensure adequate ventilation. **[new 2016]**

1.5.2.2 In prisons or immigration removal centres, everyone with X-ray changes indicative of active TB, as well as those with symptoms who are awaiting X-ray, should be isolated in an adequately ventilated individual room or cell. Prisoners and

detainees should be retained on medical hold until they have:

- proven smear-negative and had an X-ray that does not suggest active TB **or**
- had a negative risk assessment for multidrug-resistant TB and completed 2 weeks of the standard treatment regimen. **[2012, amended 2016]**

1.5.3 Multidrug-resistant TB

1.5.3.1 If people with suspected or known infectious multidrug-resistant TB are admitted to hospital, admit them to a negative pressure room. If none is available locally, transfer them to a hospital that has these facilities and a clinician experienced in managing complex drug-resistant cases. Carry out care in a negative pressure room for people with:

- suspected multidrug-resistant TB, until non-resistance is confirmed
- confirmed multidrug-resistant TB, until they have 3 negative smears at weekly intervals and ideally have a negative culture. **[new 2016]**

1.5.3.2 As soon as possible, explore options to reduce the psychosocial impact of prolonged isolation. For example, through providing free access to internet, telephone and television, and accompanied walks in the open air. **[new 2016]**

1.5.3.3 Consider earlier discharge for people with confirmed multidrug-resistant TB, if there are suitable facilities for home isolation and the person will adhere to the care plan. **[new 2016]**

1.5.3.4 For people with confirmed multidrug-resistant TB whose symptoms have improved and who are unable to produce sputum, discharge decisions should be taken by the multidisciplinary team and the health protection team. **[new 2016]**

1.5.3.5 Staff and visitors should wear filtering face piece (FFP3) masks during contact with a person with suspected or known multidrug-resistant TB while the person is thought to be infectious. **[2016]**

1.5.3.6 Before deciding to discharge a person with suspected or known

multidrug-resistant TB from hospital, agree with the person and their carers secure arrangements for supervising and administering all anti-TB therapy. **[2016]**

1.5.3.7 Discuss the decision to discharge a person with suspected or known multidrug-resistant TB with:

- the infection control team **and**
- the local microbiologist **and**
- the local TB service **and**
- the health protection team. **[2016]**

1.5.3.8 Ensure negative pressure rooms used for infection control in multidrug-resistant TB meet the standards of the Interdepartmental Working Group on Tuberculosis, and are clearly identified for staff, for example by a standard sign. Keep such signs up to date. **[2016]**

1.6 Case finding

1.6.1 Contact tracing

Human to human transmission

1.6.1.1 Once a person has been diagnosed with active TB, the diagnosing physician should inform relevant colleagues so that the need for contact tracing can be assessed without delay. Contact tracing should not be delayed until notification. **[2006]**

1.6.1.2 Offer screening to the close contacts of any person with pulmonary or laryngeal TB. **[2006, amended 2016]**

1.6.1.3 Assess symptomatic close contacts for active TB (see recommendations 1.3.1 to 1.3.4 in the section on active TB). **[new 2016]**

1.6.1.4 In asymptomatic close contacts younger than 65 years, consider standard testing for latent TB (see recommendations 1.2.1 to 1.2.3 in the section on latent TB), followed by consideration of BCG vaccination in line with the section on BCG vaccination or treatment for latent TB infection (see recommendations 1.2.4 to 1.2.6 in the section on latent TB) once active TB has been ruled out for people who:

- are previously unvaccinated **and**
- are contacts of a person with smear-positive pulmonary or laryngeal TB **and**
- are Mantoux-negative.

  At the time of publication (January 2016) the BNF states: 'The Mantoux test is recommended for tuberculin skin testing, but no licensed preparation is currently available.' For further guidance, see immunisation against infectious disease (the Green book). **[2006, amended 2016]**

1.6.1.5 In asymptomatic close contacts older than 65 years, consider a chest X-ray (if there are no contraindications), possibly leading to further investigation for active TB. **[2006, amended 2016]**

1.6.1.6 Do not routinely assess social contacts of people with TB, who will include most workplace contacts. **[2006, amended 2016]**

1.6.1.7 Assess the need for tracing social contacts of people with pulmonary or laryngeal TB if:

- the index case is judged to be particularly infectious (for example, evidenced by transmission to close contacts) **or**
- any social contacts are known to possess features that put them at high risk of going on to develop active TB. **[2006, amended 2016]**

1.6.1.8 Offer 'inform and advise' information to close and social contacts of people with smear-positive TB (see section on providing information for the public about TB). **[2006]**

Cases on an aircraft

1.6.1.9 After diagnosis of TB in an aircraft traveller, do not routinely carry out contact tracing of fellow passengers. **[2006, amended 2016]**

1.6.1.10 The notifying clinician should inform the relevant consultant in communicable disease control or health protection if:

- less than 3 months has elapsed since the flight and the flight was longer than 8 hours **and**
- the index case is smear-positive **and either**
  - the index case has multidrug-resistant TB **or**
  - the index case coughed frequently during the flight. **[2006]**

1.6.1.11 The consultant in communicable disease control or health protection should provide the airline with 'inform and advise' information to send to passengers seated in the same part of the aircraft as the index case. **[2006, amended 2016]**

1.6.1.12 If the TB index case is an aircraft crew member, contact tracing of passengers should not routinely take place. **[2006]**

1.6.1.13 If the TB index case is an aircraft crew member, contact tracing of other members of staff is appropriate, in accordance with the usual principles for screening workplace colleagues. **[2006]**

Cases in schools

1.6.1.14 After diagnosis of TB in a school pupil or member of staff, the consultant in communicable disease control or health protection should be prepared to explain the prevention and control procedures to staff, parents and the press. Advice on managing these incidents and their public relations is available from the Public Health England health protection team and the local authority. **[2006, amended 2016]**

1.6.1.15 If a school pupil is diagnosed with smear-positive TB, carry out a risk assessment

of the need to test the rest of his or her class (if there is a single class group), or the rest of the year group who share classes, as part of contact tracing. **[2006]**

1.6.1.16 If a teacher has smear-positive TB, assess the pupils in his or her classes during the preceding 3 months as part of contact tracing. **[2006]**

1.6.1.17 Consider extending contact tracing in schools to include children and teachers involved in extracurricular activities, and non-teaching staff, on the basis of:

- the degree of infectivity of the index case
- the length of time the index case was in contact with others
- whether contacts are unusually susceptible to infection
- the proximity of contact. **[2006, amended 2016]**

1.6.1.18 Treat secondary cases of smear-positive TB as index cases for contact tracing. **[2006]**

1.6.1.19 If the index case of a school pupil's TB infection is not found, and the child is not in a high-risk group for TB, contact tracing and screening (by either symptom enquiry or chest X-ray) should be considered for all relevant members of staff at the school. **[2006]**

Cases in community childcare

1.6.1.20 When an adult who works in childcare (including people who provide childcare informally) is diagnosed with smear-positive TB, follow recommendations 1.6.1.1 to 1.6.1.8. **[2006, amended 2016]**

Cases in hospital inpatients

1.6.1.21 If TB is diagnosed in a hospital inpatient, do a risk assessment. This should take into account:

- the degree of infectivity of the index case

- the length of time before the infectious patient was isolated
- whether other patients are unusually susceptible to infection
- the proximity of contact. **[2006, amended 2016]**

1.6.1.22 Carry out contact tracing and testing only for patients for whom the risk is regarded as significant. **[2006]**

1.6.1.23 Regard patients as at risk of infection if they spent more than 8 hours in the same bay as an inpatient with smear-positive TB who had a cough. Document the risk in the contact's clinical notes, for the attention of the contact's consultant. Give the contact 'inform and advise' information, and inform their GP. **[2006]**

1.6.1.24 If patients were exposed to a patient with smear-positive TB for long enough to be equivalent to close contacts (as determined by the risk assessment), or an exposed patient is known to be particularly susceptible to infection, manage their TB risk in the same way as close contacts. **[2006, amended 2016]**

1.6.1.25 If an inpatient with smear-positive TB is found to have multidrug-resistant TB, or if exposed patients are HIV positive, trace contacts following the Interdepartmental Working Group on Tuberculosis guidelines. **[2006]**

1.6.1.26 In cases of doubt when planning contact tracing after diagnosing smear-positive TB in an inpatient, seek further advice from the local or national Public Health England or Wales unit or people experienced in the field. **[2006, amended 2016]**

1.6.2 Opportunistic case finding

New entrants from high incidence countries

1.6.2.1 Assess and manage TB in new entrants from high incidence countries who present to healthcare services as follows:

- assess risk of HIV, including HIV prevalence rates in the country of origin, and take this into account when deciding whether to give a BCG vaccination

- offer testing for latent TB (see recommendations 1.2.1 to 1.2.3 in the section on latent TB)
- assess for active TB if the test for latent TB is positive (see recommendations 1.3.1 to 1.3.5 in the section on active TB)
- offer treatment to people aged 65 years or younger in whom active TB has been excluded but who have a positive Mantoux test or a positive interferon-gamma release assay for latent TB infection (see recommendations 1.2.4 to 1.2.6 in the section on latent TB)
- consider offering BCG for unvaccinated people who are Mantoux- or interferon-gamma release assay-negative (see the section on BCG vaccination)
- give 'inform and advise' information to people who do not have active TB and are not being offered BCG or treatment for latent TB infection (see the section on providing information for the public about TB). **[2006, amended 2011 and 2016]**

1.6.2.2 Primary care services should support local, community-based and voluntary organisations that work with vulnerable migrants to ensure they:

- register with a primary care provider
- know how to use NHS services (emergency or primary care). **[2012]**

1.6.2.3 Healthcare professionals, including primary care staff, responsible for testing new entrants should test all vulnerable migrants who have not previously been checked. This is regardless of when they arrived in England. People born in countries with an incidence of more than 150 per 100,000 per year should be made a priority for latent TB testing when they arrive here. **[2012, amended 2016]**

People using homeless or substance misuse services

1.6.2.4 In areas of identified need (see the section on local needs assessment), including major urban centres with a high incidence of TB, commissioners should:

- ensure there is a programme of active case-finding using mobile X-ray in places where homeless people and people who misuse substances congregate (this includes: homeless day centres, rolling shelters, hostels and temporary shelters established as part of cold weather initiatives and venues housing needle and syringe programmes)
- base the frequency of screening at any 1 location on population turnover
- where local demand does not warrant a mobile X-ray team, consider commissioning mobile X-ray capacity from another area. **[2006, amended 2012]**

1.6.2.5 Multidisciplinary TB teams should consider using simple incentives, such as providing hot drinks and snacks, to encourage people to attend for testing. **[2006, amended 2012, amended 2016]**

1.6.2.6 Commissioners of TB prevention and control programmes should consider offering people who are homeless and people who misuse substances other health interventions when they are screened for TB at a mobile X-ray unit. (Examples may include blood-borne virus screening, dentistry and podiatry services.) **[2012]**

1.6.2.7 Multidisciplinary TB teams should work closely with mobile X-ray teams and frontline staff in hostels and day centres to promote TB screening and to ensure appropriate onward referrals and follow-up. **[2012]**

1.6.2.8 Multidisciplinary TB teams should consider using peer educators to promote the uptake of TB screening in hostels and day centres. **[2012]**

1.6.2.9 Multidisciplinary TB teams should provide routine data to TB control boards on: screening uptake, referrals and the number of active TB cases identified. **[2012]**

People in prisons or immigration removal centres

1.6.2.10 Healthcare professionals in prisons and immigration removal centres should ensure prisoners and detainees are screened for TB within 48 hours of arrival.

[2012]

1.6.2.11 Prisons with Department of Health-funded static digital X-ray facilities for TB screening should X-ray all new prisoners and detainees (including those being transferred from other establishments) if they have not had a chest X-ray in the past 6 months. This should take place within 48 hours of arrival. **[2012]**

1.6.2.12 Prison and immigration removal centre health staff should report all suspected and confirmed TB cases to the local multidisciplinary TB team within 1 working day. **[2012]**

1.6.2.13 Multidisciplinary TB staff should visit every confirmed TB case in a prison or immigration removal centre in their locality within 5 working days. **[2012]**

1.6.2.14 If a case of active TB is identified, the local Public Health England unit, in conjunction with the multidisciplinary TB team, should plan a contact investigations exercise. They should also consider using mobile X-ray to check for further cases. **[2012]**

1.6.3 Active case finding in under-served groups

1.6.3.1 Multidisciplinary TB teams should follow NICE recommendations on contact tracing (see the section on contact tracing).They should coordinate contact investigations at places where the person with TB spends significant amounts of time. Examples could include pubs, crack houses, parks and community centres. The aim is to help identify people who have been living with them and people they frequently socialise with. **[2012]**

1.6.3.2 Multidisciplinary TB teams dealing with someone from an under-served group should work alongside health and social care professionals known to them to help trace relevant contacts. They should also work in partnership with voluntary, community and statutory organisations to conduct outreach contact investigations. **[2012]**

1.6.3.3 Multidisciplinary TB teams should, if available and appropriate, encourage peer educators or TB programme support workers to help with contact investigations

involving under-served people who have complex social networks. **[2012]**

1.6.3.4 Multidisciplinary TB teams in discussion with local Public Health England health protection teams should consider using digital mobile X-ray for active case-finding in settings identified by looking at social networks as places where under-served people at risk congregate. They should also provide the necessary support so that multidisciplinary TB teams can use strain-typing and social network analysis to ascertain where transmission is occurring in the community. (Examples of transmission sites may include pubs, crack houses, hostels and day centres.) They should focus on active case-finding in the settings identified. **[2012, amended 2016]**

1.6.4 Incident and outbreak response

1.6.4.1 Multidisciplinary TB teams should coordinate incident or outbreak contact investigations at places where the person with active TB spends significant amounts of time. Examples include workplaces, schools, colleges, universities, childcare settings. Identify people that the person with TB frequently spends substantial time with, as outlined in the section on contact tracing. **[new 2016]**

1.6.4.2 Multidisciplinary TB teams should refer any incident in a congregate setting to the local Public Health England health protection team for risk assessment within 5 working days of suspicion of a potential incident. **[new 2016]**

1.6.4.3 TB control boards working with local health protection teams should, through local arrangements, mobilise existing staff or have access to an incident team that will:

- undertake an incident risk assessment and provide advice
- support or undertake contact investigations
- provide information and communication support to the multidisciplinary TB team, the local director of public health, the setting in which the incident has occurred and the people affected including:
  - written advice, printed or by email

- question and answer sessions
- telephone advice
- media engagement

- gather and collate data, and report on outcomes to measure the effectiveness of the investigation (for example, offering testing to all people identified at risk and monitoring uptake)
- report back to TB control boards at appropriate times. This includes when outcomes of initial investigation of people classified as close contacts are available. It also includes when a decision is made to broaden the investigation to the next stage using the concentric circle method for risk assessment. **[new 2016]**

1.6.4.4 When incidents have been identified, multidisciplinary TB teams in discussion with local Public Health England health protection teams should consider providing support for strain-typing and other analysis to ascertain where transmission is occurring. (Examples of transmission sites may include workplaces, schools, colleges, universities, childcare settings.) **[new 2016]**

1.6.4.5 In all types of contact investigation scenarios (active case finding, incident or outbreak investigations) multidisciplinary TB teams should investigate all people who have been in contact with children who have pulmonary or extrapulmonary TB to identify the primary source of infection. If necessary, they should look beyond immediate close contacts to find the source. **[2012, amended 2016]**

1.7 Adherence, treatment completion and follow-up

1.7.1 Improving adherence: case management including directly observed therapy

1.7.1.1 Allocate a named TB case manager to everyone with active TB as soon as possible after diagnosis (and within 5 days). The clinical team should tell each person who their named TB case manager is and provide contact details. **[2006,**

2012 amended 2016]

1.7.1.2 The TB case managers should work with the person diagnosed with TB to develop a health and social care plan, and support them to complete therapy successfully. The TB case manager should:

- offer a risk assessment to every person with TB, to identify their needs and whether they should have enhanced case management including directly observed therapy
- educate the person about TB and the treatment
- develop an individual care plan after discussion with the person
- gain the person's consent to the plan and agree a review date (for example, when moving from initiation to maintenance, or at each contact to ensure the person's needs are being met)
- coordinate discharge planning, especially for people on directly observed therapy
- involve representatives from other allied professions and key workers from all organisations who work with the person, if appropriate
- explore appropriate ways that peers and voluntary organisations can provide support. **[2006, 2012, amended 2016]**

1.7.1.3 Offer directly observed therapy as part of enhanced case management in people who:

- do not adhere to treatment (or have not in the past)
- have been treated previously for TB
- have a history of homelessness, drug or alcohol misuse
- are currently in prison, or have been in the past 5 years
- have a major psychiatric, memory or cognitive disorder
- are in denial of the TB diagnosis

- have multidrug-resistant TB
- request directly observed therapy after discussion with the clinical team
- are too ill to administer the treatment themselves. **[2012, amended 2016]**

1.7.1.4 In children whose parents are members of any of the above groups, offer directly observed therapy as part of enhanced case management and include advice and support for parents to assist with treatment completion. **[2016]**

1.7.1.5 Re-evaluate the need for directly observed therapy throughout the course of TB treatment whenever the person's (or in the case of children, parents') circumstances change. **[new 2016]**

1.7.1.6 TB case managers should ensure the health and social care plan (particularly if directly observed therapy is needed) identifies why a person may not attend for diagnostic testing or follow a treatment plan, and how they can be encouraged to do so. It should also include ways to address issues such as fear of stigmatisation, support needs and/or cultural beliefs, and may include information on:

- demographics (for example, age, nationality, place of birth, length of time in UK)
- all current prescribing regimens
- housing needs and living situation, including looked-after children
- substance misuse (drugs or alcohol)
- any contact with the criminal justice system
- the need for hepatitis B and C or HIV testing (see recommendations 1.2.5.2 and 1.2.5.3 in the section on managing latent TB in adults and recommendation 1.2.6.1 in the section on managing latent TB in children and young people)
- HIV status
- other health conditions (physical or mental)

- communication factors (for example, language and literacy levels)
- ability to access treatment (mobility and transport needs)
- employment or entitlement to benefits
- legal or immigration status (including risk of removal or relocation within the UK)
- any enablers or incentives to overcome anything that is stopping diagnosis or treatment. **[2012, amended 2016]**

1.7.1.7 The health and social care plan should:

- state who will be observing treatment and where (if the person is having directly observed therapy this should be provided at a location that is convenient and accessible to them, for example, at a methadone clinic) **[2012, amended 2016]**
- include actions to take if contact with the person is lost (for example, keeping details of people who might be able to help re-establish contact) **[2012]**
- refer to, and be coordinated with, any other care plan already established for the person **[2012]**
- define the support needed to address any unmet health and social care needs (for example, support to gain housing or other benefits, or to help them access other health or social care services) **[2012, amended 2016]**
- include a commitment from the person to complete their TB treatment **[2012, amended 2016]**
- be supported by frequent contact with any key workers who work with the person. **[2006 amended 2011, amended 2016]**

1.7.1.8 Multidisciplinary TB teams should aim to find people with active TB who are lost to follow-up, or who stop using services before completing diagnostic investigations. They should report all those lost to follow-up to local Public Health England teams, GPs, the referring organisation and specialist outreach teams. **[2012]**

1.7.2 Other strategies to encourage people to follow their treatment plan

1.7.2.1 To encourage people to follow their treatment plan, involve people in treatment decisions for active or latent TB from the start. Emphasise the importance of following the treatment plan when agreeing the regimen. **[2016]**

1.7.2.2 Multidisciplinary TB teams should implement strategies for active and latent TB to encourage people to follow the treatment plan and prevent people stopping treatment early. These could include:

- reminder letters, printed information, telephone calls, texts and apps using an appropriate language **[2006, amended 2016]**
- health education counselling and patient-centred interviews **[2006, amended 2016]**
- tailored health education booklets from quality sources (see section on providing information for the public about TB) **[2006, amended 2016]**
- home visits **[2006]**
- random urine tests and other monitoring (for example, pill counts) **[2006]**
- access to free TB treatment for everyone (irrespective of eligibility for other NHS care) and information about help with paying for prescriptions **[2006, 2012, amended 2016]**
- social and psychological support (including cultural case management and broader social support) **[new 2016]**
- advice and support for parents and carers **[new 2016]**
- incentives and enablers to help people follow their treatment regimen. **[new 2016]**

1.7.2.3 TB control boards should ensure services take into account the barriers facing vulnerable migrants who may need treatment, and in particular the stigma they may face. Other issues include the location of services (both geographically and in terms of opening times) and people's language and cultural needs, in terms of

the format of advice and the type of information given. **[2012, amended 2016]**

1.7.3 Strategies in prisons or immigration removal centres

1.7.3.1 On arrival at a prison or immigration removal centre, healthcare professionals should ask all prisoners and detainees (including those being transferred from other establishments) if they are taking TB medication, to ensure continuity of treatment. **[2012]**

1.7.3.2 All prisoners and immigration removal centre detainees having treatment for active TB should have a named TB case manager. The case manager should be responsible for contingency planning for discharge from prison or detention. **[2012]**

1.7.3.3 Prisons and immigration removal centres should ensure multidisciplinary TB staff have access to prisoners and detainees who need treatment (for example, by being given security clearance). **[2012]**

1.7.3.4 All prisoners having treatment for active TB should have directly observed therapy. **[2012]**

1.7.3.5 Prison health services should have contingency, liaison and handover arrangements to ensure continuity of care before any prisoner on TB treatment is transferred between prisons or released. In addition, other agencies working with prisoners or detainees should also be involved in this planning. **[2012]**

1.7.3.6 Prison and immigration removal centre healthcare services should liaise with the named TB case manager (from the multidisciplinary TB team) to ensure contingency plans for continuation of treatment are drawn up for prisoners and immigration removal centre detainees with TB. **[2012]**

1.7.3.7 Multidisciplinary TB teams should ensure accommodation is available for the duration of TB treatment after the prisoner or detainee's release (see section on Identifying and managing active TB in prisons, custody suites or immigration removal centres: organisational factors). **[2012]**

1.7.3.8 Multidisciplinary TB teams should ensure directly observed therapy is arranged for prisoners or detainees being treated for TB after their release. This should be available close to where they will live in the community. **[2012]**

1.7.4 Re-establishing treatment for active or latent TB after interruptions because of adverse events

1.7.4.1 In people who have experienced a treatment interruption because of drug-induced hepatotoxicity:

- investigate other causes of acute liver reactions **and**
- wait until aspartate or alanine transaminase levels fall below twice the upper limit of normal, bilirubin levels return to the normal range and hepatotoxic symptoms have resolved **then**
- sequentially reintroduce each of the anti-TB drugs at full dose over a period of no more than 10 days, starting with ethambutol and either isoniazid (with pyridoxine) or rifampicin. **[new 2016]**

1.7.4.2 In people with severe or highly infectious TB who need to interrupt standard therapy because of a reaction, consider continuing treatment:

- for hepatotoxicity, a combination of at least 2 anti-TB drugs of low hepatotoxicity (such as ethambutol and streptomycin, with or without a fluoroquinolone antibiotic, such as levofloxacin or moxifloxacin) and monitor with a liver specialist for further reactions

  See the MHRA January 2024 advice on restrictions and precautions for using fluoroquinolone antibiotics because of the risk of disabling and potentially long-lasting or irreversible side effects.

  Not licensed for tuberculosis, so use would be off label. The prescriber should follow relevant professional guidance, taking full responsibility for the decision. Informed consent should be obtained and documented. See the General Medical Council's Good practice in prescribing and managing medicines and devices for further information.

- for a cutaneous reaction, a combination of at least 2 anti-TB drugs with a low risk of cutaneous reactions (such as ethambutol and streptomycin) and monitor with a dermatologist for further reactions. **[new 2016, amended 2019]**

1.7.4.3 If another reaction of a similar or greater severity occurs because of reintroducing a particular drug, do not give that drug in future regimens and consider extending the total regimen accordingly. **[new 2016]**

1.7.5 Follow-up after treatment completion

1.7.5.1 Follow-up clinic visits should not be conducted routinely after treatment completion. **[2006]**

1.7.5.2 Tell patients to watch for symptoms of relapse and how to contact the TB service rapidly through primary care or a TB clinic. Key workers should ensure that patients at increased risk of relapse are particularly well informed about symptoms. **[2006]**

1.7.5.3 Patients who have had drug-resistant TB should be considered for follow-up for 12 months after completing treatment. Patients who have had multidrug-resistant TB should be considered for prolonged follow-up. **[2006]**

1.8 Service organisation

When using the recommendations in this section with under served groups, also check sections 1.1.1 on raising and sustaining awareness, 1.1.2 on providing information for the public, 1.6.2 on opportunistic case finding, 1.6.3 on active case finding in under served groups and 1.7 on adherence, treatment completion and follow up. See also, recommendations on under served groups in section 1.2.3 on diagnosing latent TB in all age groups.

1.8.1 Strategic oversight and commissioning of TB prevention and

control activities

1.8.1.1 Public Health England, in partnership with NHS England, should take responsibility for national oversight of TB prevention and control activities. This includes setting up TB control boards (see section 1.8.2). **[2012, amended 2016]**

1.8.1.2 Public Health England and NHS England should consider working together to establish control boards in agreed geographical areas and employ appropriate staff (see recommendation 1.8.2.3). **[new 2016]**

1.8.1.3 Clinical commissioning groups and local authority public health teams working in partnership with Public Health England and NHS England should consider collaborative commissioning arrangements through TB control boards. This could, for example, include working with 1 or more clinical commissioning groups to cover a major metropolitan district, region or TB control board area taking into account:

- local TB incidence
- local at-risk populations and their movements across different geographical areas
- existing service configurations for organisations involved in TB prevention and control
- the need to share services, such as mobile X-ray facilities, and outreach incident teams across different geographical areas. **[2012, amended 2016]**

1.8.1.4 TB control boards should develop TB prevention and control programmes working with commissioners, Public Health England and NHS England. The board could include clinical, commissioning (from clinical commissioning groups, local government and the voluntary sector) and public health leaders and people with TB or groups who advocate on their behalf from across the control board area. This may include identifying a lead clinical commissioning group, which could be led by an executive director of that commissioning group working with the board. Feedback mechanisms between local commissioning groups and the TB control board should be developed. **[new 2016]**

1.8.1.5 An executive director of local commissioning groups, working with the local

director of public health or another nominated public health consultant, should lead implementation of the programme in their locality. The lead should ensure a comprehensive prevention and control programme is commissioned to support the level of need (see section on local needs assessment) and that they work with the control board regularly. **[2012, amended 2016]**

1.8.1.6 Working together through TB control boards and local networks, commissioners, local government and Public Health England should ensure TB prevention and control programmes set up multidisciplinary TB teams to provide all TB services (see section on commissioning multidisciplinary TB support). They should ensure that local strategy and service commissioning focuses on an end-to-end pathway. **[2012, amended 2016]**

1.8.1.7 Working together through TB control boards, commissioners and Public Health England should ensure the TB prevention and control programme is informed by relevant NICE guidance and developed in collaboration with clinical services. It should also be informed by the standard minimum data set collected through local needs assessment and service audit. **[2012, amended 2016]**

1.8.1.8 Working together through TB control boards, commissioners and Public Health England should ensure the TB prevention and control programme targets all ages, including children, and covers all aspects of TB prevention and control (see recommendations 1.8.2.1 and 1.8.2.2), including but not limited to:

- active case finding (contact investigations and identifying latent TB in high-risk groups)
- awareness-raising activities
- standard and enhanced case management (including providing directly observed therapy and free treatment)
- finding people lost to follow-up and encouraging them back into treatment
- incident and outbreak control
- monitoring, evaluating and gathering surveillance and outcome data. **[2012, amended 2016]**

1.8.1.9 Working together through TB control boards, commissioners, Public Health England and the voluntary sector should ensure TB prevention and control programmes take account of the need to work with other programmes targeting specific high-risk groups, such as those who are under-served. Examples include programmes focused on the health of asylum seekers and refugees, under-served children, homelessness and housing, offenders and people who misuse substances. **[2012, amended 2016]**

1.8.1.10 TB control boards should consider integrating TB and HIV services, joint clinics and training opportunities. **[new 2016]**

1.8.1.11 Commissioners should consider commissioning support and advice to all groups diagnosed with TB irrespective of whether they are under-served. **[new 2016]**

1.8.2 Developing the TB prevention and control programme

1.8.2.1 TB control boards should be responsible for developing a TB prevention and control programme based on the national strategy and evidence-based models. **[new 2016]**

1.8.2.2 TB control boards should plan, oversee, support and monitor local TB control, including clinical and public health services and workforce planning. **[new 2016]**

1.8.2.3 TB control boards should assess services in their area, identify gaps in provision and develop plans to meet these, including:

- undertaking a workforce review to support local or regional commissioning of TB services to meet the needs of their population (see sections on local needs assessment and cohort review)
- supporting development of appropriate services and pathways to improve access and early diagnosis (see the sections on rapid-access radiology and other investigation results: referral to multidisciplinary TB team process, non-clinical roles including TB support workers and rapid-access TB services)
- negotiating arrangements to cover the cost of additional services to address

specific gaps in current TB control arrangements. **[new 2016]**

1.8.2.4 TB control boards should ensure cohort review is undertaken at least quarterly, and the results are fed back to local clinical and TB networks. These should be agreed by accountable bodies such as clinical commissioning groups, trust management, regional Public Health England and centre directors and local authority directors of public health as agreed, all of whom should make sure appropriate action is taken. **[new 2016]**

1.8.2.5 TB control boards should enable full and consistent use of national guidelines including:

- ensuring the needs of all people with TB, particularly under-served populations, are addressed
- ensuring contact tracing arrangements are appropriate to the needs of the population (see the section on case finding)
- assuring themselves that TB control in low-incidence areas is established and delivered appropriately (see the section on rural services: organisational and support factors)
- assuring themselves that multidrug-resistant TB is managed appropriately (see the section on multidrug-resistant TB) and mechanisms are in place to ensure:
  - there is sufficient clinical expertise available to manage cases
  - regional multidrug-resistant TB networks take account of expert advice (see section 1.8.3). **[new 2016]**

1.8.2.6 TB control boards should develop links and partnerships and establish agreed relationships and lines of accountability between TB control boards and local clinical and TB networks. This includes engaging with other key stakeholders to ensure universal coverage of TB control efforts. **[new 2016]**

1.8.2.7 TB control boards should collaborate with their local and regional partners. They should agree and establish regular monitoring, surveillance and reporting arrangements with all partners to support needs assessment (see the section on

local needs assessment) and regular audit and evaluation. **[new 2016]**

1.8.2.8 TB control board staff should have clearly defined roles and responsibilities. Their roles and responsibilities could include:

- Establishing the links, partnerships and relationships between all aspects of the control board area within their remit (if necessary across usual geographical commissioning boundaries).
- Developing and supporting adoption and implementation of evidence-based model service specifications for the clinical and public health actions needed to control TB including:
  - improving access and early diagnosis (see the sections on raising and sustaining awareness of TB, providing information for the public about TB, rapid-access radiology and other investigation results: referral to multidisciplinary TB team process and non-clinical roles including TB support workers)
  - diagnostics, treatment and care services (see the sections on latent TB and active TB)
  - contact investigations and tracing (see the sections on diagnosing latent TB in adults and case finding)
  - cohort review
  - vaccination (see the section on BCG vaccination)
  - drug resistance (see the section on multidrug-resistant TB)
  - tackling TB in under-served populations
  - surveillance, monitoring and quality assurance
  - workforce development and commissioning (see the sections on commissioning multidisciplinary TB support and non-clinical roles including TB support workers). **[new 2016]**

1.8.2.9 TB control boards should ensure there is sufficient capacity available to them to manage a sudden increase in demand such as:

- TB contact investigations, (such as incidents in congregate settings)
- large scale active case-finding initiatives in under-served groups in the community
- outbreaks in a variety of settings or sites where transmission risk may be high, including but not limited to schools, workplaces, hostels and prisons. **[new 2016]**

1.8.2.10 To set up, monitor and evaluate a TB control programme, TB control boards should:

- agree plans within their partnerships to assess local services against the service specifications
- develop plans and quality standards to secure improvements
- establish quality assurance mechanisms and regular audits including, but not limited to, cohort review for all aspects of the TB control board partnership plans. **[new 2016]**

Coordinating local TB networks

1.8.2.11 TB control boards should (in collaboration with commissioners) consider the need for a TB network local coordinator, particularly if working across multiple clinical commissioning group areas (see recommendation 1.8.1.3). **[new 2016]**

1.8.2.12 The coordinator should work in close collaboration with clinicians and all relevant multidisciplinary TB teams to develop the network and be responsible for:

- setting up the network and developing it based on needs, reporting back to the TB control board regularly
- establishing the links, partnerships and relationships across their local network (if necessary across usual geographical commissioning boundaries). **[new 2016]**

1.8.3 Regional multidrug-resistant TB network

1.8.3.1 TB control boards should consider setting up a regional multidisciplinary TB network to oversee management of multidrug-resistant TB. This could:

- Identify and designate regional expert centres.
- Ensure all healthcare professionals who suspect or treat a case of multidrug-resistant TB are informed about and have access to specialist advisory services for multidrug-resistant TB. This includes the designated expert centre in their regional network and may also include the national advisory service for multidrug-resistant TB (currently provided by the British Thoracic Society).
- Ensure all cases of multidrug-resistant TB are discussed at the regional multidisciplinary TB team meeting in the local clinical network.
- Formally consider and record the advice from the specialist advisory services for multidrug-resistant TB provided by the designated regional expert centre or the national advisory service for multidrug-resistant TB. **[new 2016]**

1.8.4 Rural services: organisational and support factors

1.8.4.1 Commissioners in rural areas (working with the TB control board) should consider collaborative approaches to deliver and manage TB services. They could, for example, set up a network including areas with high and low incidence of TB. **[new 2016]**

1.8.5 Local needs assessment

1.8.5.1 Directors of public health, in discussion with local health protection teams, should ensure that TB is part of the joint strategic needs assessment. **[2012, amended 2016]**

1.8.5.2 Directors of public health should provide commissioners of TB prevention and control programmes and TB control boards with local needs assessment

information annually using data provided by Public Health England. **[2012, amended 2016]**

1.8.5.3 Commissioners of TB prevention and control programmes should ensure services reflect the needs of their area, identified by needs assessment. Health and wellbeing boards should ensure that local TB services have been commissioned based on local needs identified through needs assessment. **[2012, amended 2016]**

1.8.5.4 Directors of public health and TB control boards should use cohort review (see section 1.8.6) and other methods to collect data on the following, to inform local needs assessment:

- Number of annual notified TB cases (see Public Health England's enhanced TB surveillance data and annual 'suite of indicators').
- Size, composition (for example, age and ethnicity) and distribution of local at-risk groups.
- Indices of social deprivation.
- Local statutory and non-statutory services working with these groups.
- Organisation of local TB services, including the composition and capacity of the local multidisciplinary TB team(see the results of local audit) and location of services. This may also include data to support evaluating the need for integrated TB/HIV services including joint clinics.
- Numbers needing enhanced case management (see the section on adherence, treatment completion and follow-up).
- Numbers receiving directly observed therapy from the start of, or at any point during, treatment (see Public Health England's enhanced TB surveillance data).
- Evidence of recent transmission (for example, using DNA fingerprinting or surrogate markers such as number of cases in children under 5 years (see UK TB national strain-typing database and local incident and outbreak reports).
- Completeness and yield of contact investigations. This includes: proportion

of smear-positive cases with 0, 5 or more contacts identified; proportion of identified contacts clinically assessed; and proportion of contacts with latent TB infection who successfully complete treatment.

- Active case-finding initiatives, incident contact investigations and identification of latent TB infection in high-risk groups.
- Treatment outcomes for everyone grouped according to social risk factors and by the use of directly observed therapy (including rates of loss to follow-up and treatment interruptions, see Public Health England's enhanced TB surveillance data).
- Local education and awareness-raising programmes for under-served groups, professionals and practitioners working with them.
- Views and experiences of people with TB, carers and the services working with them. **[2012, amended 2016]**

1.8.5.5 Local needs assessments should also be equity proofed to assess the potential effect of planning, commissioning and policy decisions on health inequalities (see planning and commissioning services in NICE's local government briefing on health inequalities and population health). **[new 2016]**

1.8.6 Cohort review

1.8.6.1 TB control boards and prevention and control programme leads should initiate, audit and evaluate cohort reviews in their commissioning area. Quarterly cohort review meetings should take place in the area covered by the programme. Combine these meetings with others if possible, or use technology to make it easier for clinicians and case managers to attend. **[2012, amended 2016]**

1.8.6.2 TB case managers should present standardised information on each case, including: demographic information, HIV test results, pre-treatment and ongoing status (clinical, laboratory, radiology), adherence to treatment and the results of contact investigations. **[2012, amended 2016]**

1.8.6.3 TB case managers and key allied professionals from the TB prevention and

control programme should attend cohort review meetings. This could include the lead clinician (who may or may not be the case manager). Either a paediatrician with experience and training in the treatment of TB or a general paediatrician with advice from a specialised clinician should be present when cases of children with TB are presented. **[2012, amended 2016]**

1.8.6.4 The chair of the cohort review should not work for any of the TB services included in the review. Examples of possible chairs include a public health consultant, a specialist physician or a senior TB nurse, preferably from a different geographical area. Alternatively the chair could be a representative from the local Public Health England health protection team or the TB control board. **[2012, amended 2016]**

1.8.6.5 Multidisciplinary TB teams, in conjunction with Public Health England units, should collate and present cohort review data on TB treatment and the outcome of contact investigations at the review meetings. In addition, progress towards national, regional and local service targets should be presented. **[2012, amended 2016]**

1.8.6.6 TB control boards, directors of public health and local public health consultants should ensure outputs from the cohort review feed into the needs assessment for TB services. TB control board directors should attend the cohort review at least once a year. **[2012, amended 2016]**

1.8.6.7 TB case managers should feed back promptly to multidisciplinary TB teams on issues identified as a result of cohort review. The results of the cohort review should be collated locally and agreed by the chair before being fed back to TB control boards, commissioners and health and wellbeing boards regularly and via needs assessment. **[2012, amended 2016]**

1.8.6.8 People participating in a cohort review should review the results and evaluate local services (for example, auditing adverse outcomes, rates of culture confirmation, treatment completion rates or time to diagnosis). **[2012, amended 2016]**

1.8.7 Commissioning multidisciplinary TB support

1.8.7.1 Commissioners should ensure multidisciplinary TB teams:

- Have the skills and resources to manage the care of people with active TB who are not from under-served groups. **[2012, amended 2016]**
- Include at least 1 TB case manager with responsibility for planning and coordinating the care of under-served people and those with active TB who receive enhanced case management. **[2012, amended 2016]**
- Have the resources to manage latent TB care in under-served groups and the wider population. **[new 2016]**
- Include a range of clinical specialties in the multidisciplinary TB team, including paediatrics, infection control and respiratory medicine. **[2012]**
- Have regular attendance at these multidisciplinary team and cohort review meetings for all team members included as a programmed activity as part of their work planning. **[new 2016]**
- Have the skills and resources necessary to manage the care of people with complex social and clinical needs (either directly or via an established route). This includes the ability to provide prompt access (or if necessary, referral) to skilled outreach and advocacy workers who can draw on the services of allied practitioners. The aim is to address people's housing, asylum, immigration, welfare, substance dependency and other health and social care needs. (The allied practitioner support should include both a specified housing officer and a social worker.) **[2012]**
- Can provide rapid access TB clinics for all cases, including under-served groups. **[2012]**
- Consider providing administration support for TB nurses and case managers so they have capacity for clinical and case management work. This could include giving TB nurses access to computer hardware and software. **[new 2016]**
- Have the resources to provide a continuous service throughout the year, ensuring the TB service accounts for the following to manage continuity of

care:

- planned absence (for example, professional development, mandatory training, annual, maternity or paternity leave)
- unplanned absence (such as sickness absence). **[2012, amended 2016]**

- Can provide prompt access to a professional who has training and experience in assessing and protecting children and vulnerable adults at risk of abuse or neglect. **[2012]**
- Have access to funds through local government and clinical commissioning groups that can be used flexibly to improve adherence to treatment among under-served groups. For example, funds could be used to provide transport to clinics, to provide support or enablers for treatment, or for paying outreach workers or community services to support directly observed therapy. Funds may also be used to provide accommodation during treatment. **[2012, amended 2016]**
- Have the resources to provide ongoing TB awareness-raising activities for professional, community and voluntary (including advocacy) groups that work with populations at high risk of TB (see the section on raising and sustaining awareness of TB). These resources could be financed by local government or clinical commissioning groups. **[2012, amended 2016]**

1.8.7.2 Commissioners should ensure NHS England's safe staffing principles are applied when commissioning TB services.

The staffing ratios used in Public Health England and NHS England's collaborative tuberculosis strategy for England (published in 2015) came from NICE's guideline on tuberculosis: identification and management in under-served groups (published in 2012) which has been replaced by this guideline.

NICE's 2012 guideline on tuberculosis: identification and management in under-served groups recommended 1 WTE case manager per 40 incident cases needing standard management and 1 WTE case manager per 20 incident cases needing enhanced case management. **[new 2016]**

1.8.8 Non-clinical roles including TB support workers

1.8.8.1 TB control boards and local TB services should consider employing trained, non-clinically qualified professionals to work alongside clinical teams to agreed protocols, and to contribute to a variety of activities. Examples of this may include awareness raising and supporting people to attend appointments (including other health and social care appointments). They could also help with collecting samples, contact tracing, case management including directly observed therapy and cohort review, or any other aspect of the service if:

- they are trained to deliver the intervention or processes effectively
- they are supported, mentored and supervised by a named case manager, such as a TB nurse
- they have the skills to monitor, evaluate and report on their work practices and outcomes to maintain a process of ongoing evaluation and service improvement in relation to cohort review (see the section on cohort review). **[new 2016]**

1.8.8.2 TB control boards should ensure that people working in the TB service have the right knowledge, engagement, advocacy and communication skills to meet the needs (for example, language, cultural or other requirements) of all the groups they may work with. **[new 2016]**

1.8.8.3 Commissioners should consider taking into account different needs across traditional geographical and organisational boundaries. Put agreements in place so that staff can work across these boundaries, covering the whole service or TB control board area if appropriate. **[new 2016]**

1.8.8.4 Commissioners and TB control boards should ensure they put in place appropriate governance (including clear lines of accountability and extension of scope of practice) and data sharing practices and agreements. This includes ensuring they are part of service level agreements between NHS and non-NHS services, for example, the third sector or local government, and appropriate training has been completed. **[new 2016]**

1.8.9 Rapid-access TB services

1.8.9.1 Multidisciplinary TB teams should establish relationships with statutory, community and voluntary organisations that work with people at risk of TB to develop appropriate TB referral pathways. They should ensure these organisations know how to refer people to local TB services. **[2012]**

1.8.9.2 Multidisciplinary TB teams should accept referrals from healthcare providers and allied organisations working in the community with under-served groups. This includes voluntary and statutory organisations (for example, mobile X-ray teams or community organisations or outreach workers working with vulnerable migrants). **[2012]**

1.8.9.3 Multidisciplinary TB teams should accept self-referrals to TB clinics by people who suspect they have TB or have recently been in contact with someone with TB. **[2012, amended 2016]**

1.8.9.4 Multidisciplinary TB teams should consider accepting direct referrals from emergency departments (see the section on rapid-access radiology and other investigation results: referral to multidisciplinary TB team process). **[new 2016]**

1.8.9.5 Healthcare professionals should consider urgent referral to TB clinics for people with suspected active TB. They should also ensure the results from first-line diagnostic tests (including a sputum smear and chest X-ray) are available before the person sees a specialist. (Note: this should not delay the referral.) **[2012, amended 2016]**

1.8.9.6 Multidisciplinary TB teams should have pathways to triage referrals, start investigations and collect clinical information before the person is seen by a physician. **[new 2016]**

1.8.9.7 While triaging, multidisciplinary TB teams should ensure everyone is given information about TB as part of the process (see the section on providing information for the public about TB). This should include who the person should contact if they have any questions and how to access advice or information from support groups, national charities such as TB Alert and other sources such as local government (for example, public health or social care teams). **[2016]**

1.8.9.8 Multidisciplinary TB teams should ensure people who have a smear-positive result or imaging features highly suggestive of smear-positive TB (for example, evidence of cavitation on chest X-ray) are assessed the next working day. This is so that case management and infection control procedures start promptly. **[2012, amended 2016]**

1.8.9.9 The multidisciplinary TB team should assess people who are not smear-positive but have imaging that suggests pulmonary or laryngeal TB as soon as possible. This should be no later than 5 working days after a referral. **[2012, amended 2016]**

1.8.9.10 Multidisciplinary TB teams should, where necessary, be able to provide or arrange outreach services to ensure sputum samples or other assessments such as contact investigations can be arranged in the community. **[2016]**

1.8.10 Identifying and managing active TB in prisons, custody suites or immigration removal centres: organisational factors

1.8.10.1 Multidisciplinary TB teams, prisons, custody suites and immigration removal centre healthcare services should have named TB liaison leads to ensure they can communicate effectively with each other. **[2012, amended 2016]**

1.8.10.2 Prison, custody suites and immigration removal centre healthcare services should develop a TB policy by working with the TB control board and multidisciplinary TB team and the local Public Health England health protection team. **[2012, amended 2016]**

1.8.10.3 Multidisciplinary TB teams, in conjunction with prisons, custody suites and immigration removal centre healthcare services, should agree a care pathway for TB. This is to ensure that any suspected or confirmed cases are reported to, and managed by, the multidisciplinary TB team. **[2012, amended 2016]**

1.8.10.4 Multidisciplinary TB teams, in liaison with prisons, custody suites or immigration removal centre healthcare providers, should manage all cases of active TB. Investigations and follow-up should be undertaken within the prison or immigration removal centre if possible. **[2012, amended 2016]**

1.8.11 Accommodation during treatment

1.8.11.1 Multidisciplinary TB teams should assess the living circumstances of people with TB. Where there is a housing need they should work with allied agencies to ensure that all those who are entitled to state-funded accommodation receive it as early as possible during their treatment, for example, as a result of a statutory homelessness review and identified need. **[2012, amended 2016]**

1.8.11.2 Multidisciplinary TB teams, commissioners, local authority housing lead officers and other social landlords, providers of hostel accommodation, hospital discharge teams, Public Health England and the Local Government Association should work together to agree a process for identifying and providing accommodation for homeless people diagnosed with active pulmonary TB who are otherwise ineligible for state-funded accommodation. This includes people who are not sleeping rough but do not have access to housing or recourse to public funds. The process should detail the person's eligibility and ensure they are given accommodation for the duration of their TB treatment. **[2012, amended 2016]**

1.8.11.3 Local government and clinical commissioning groups should fund accommodation for homeless people diagnosed with active TB who are otherwise ineligible for state-funded accommodation. Use health and public health resources, in line with the Care Act 2014. **[2012, amended 2016]**

1.8.11.4 Multidisciplinary TB teams should make people who would not otherwise be entitled to state-funded accommodation aware that they may lose this accommodation if they do not comply with treatment. They should ensure plans are made to continue housing people once their TB treatment is completed. **[2012]**

1.8.11.5 Public Health England, working with the Local Government Association and their special interest groups, should consider working with national housing organisations such as the Chartered Institute of Housing, Homeless Link, Sitra and the National Housing Federation to raise the profile of TB. This is to ensure people with TB are considered a priority for housing. **[new 2016]**

1.8.11.6 Consider training housing commissioners and frontline staff on TB and the need

for housing support, so that they understand that a stable home life is a prerequisite to successful TB treatment. **[new 2016]**

Terms used in this guideline

Active case-finding

Systematically identifying people with active or latent TB using tests, examinations or other procedures.

Adherence

The term adherence refers to the person's ability or willingness to keep to a treatment regimen as directed.

Adults

People aged 18 or older.

Case management

Case management involves follow-up of a person suspected or confirmed to have TB. It needs a collaborative, multidisciplinary approach and should start as soon as possible after a suspected case is discovered.

Case manager

Standard and enhanced case management is overseen by a case manager who will usually be a specialist TB nurse or (in low-incidence areas) a nurse with responsibilities that include TB. Depending on the person's circumstances and needs, case management can also be provided by appropriately trained and supported non-clinical members of the TB multidisciplinary team.

Children

People aged 15 or younger.

Children and young people

People aged 17 or younger.

Close contacts

'Close contacts' are people who have had prolonged, frequent or intense contact with a person with infectious TB. For example, these could include 'household contacts', those who share a bedroom, kitchen, bathroom or sitting room with the index case. Close contacts may also include boyfriends or girlfriends and frequent visitors to the home of the index case. Depending in the circumstances, occasionally coworkers are classed as 'close contacts although they are more usually classed as 'social contacts'.

Cohort review

Cohort review is a systematic quarterly audit of the management and treatment of all TB patients and their contacts. The 'cohort' is a group of cases counted over a specific time, usually 3 months. Brief details of the management and outcomes of each case are reviewed in a group setting. The case manager presents the cases they are responsible for, giving the opportunity to discuss problems and difficulties in case management, service strengths and weaknesses, and staff training needs.

Congregate setting

A place where people congregate or an institutional setting such as a workplace, prison, hostel, or childcare or educational setting, where social contacts might have had significant exposure to TB.

Contact

A person who has spent time with someone with infectious TB. See also 'close contact' and 'social contact'.

Contact investigation

Clinical investigations (diagnostic testing) of people identified as having had significant exposure to a case of TB, including tests to diagnose latent or active TB. The aims of contact investigations are to:

- detect active TB earlier to offer treatment and prevent further transmission
- detect latent TB that may benefit from drug treatment
- detect people not infected but for whom BCG vaccination might be appropriate.

Contact tracing

Identifying people who may have come into contact with a person with infectious TB and assessing them for risk of significant exposure to TB. The aim is to find associated cases, to detect people with latent TB and to identify those not infected but for whom BCG vaccination might be appropriate.

Disseminated TB

Blood-borne spread of TB that may or may not be accompanied by chest X-ray or high resolution CT changes.

Enablers

Methods of helping someone to overcome barriers to completing diagnostic investigations and TB treatment. Examples of barriers include: transport, housing, nutrition and immigration status.

Enhanced case management

Management of TB for someone with clinically or socially complex needs. It starts as soon as TB is suspected. As part of enhanced case management, the need for directly observed treatment is considered, along with a package of supportive care tailored to the person's needs.

Equity proofed

Tools such as health equity audit and health impact assessment have been used systematically to assess the potential effect of all policies, programmes and activities (including those without an explicit health focus) on health inequalities. Equity proofing helps ensure all policies and programmes address the social determinants of health and health inequalities. Including a health equity audit as part of the joint strategic needs assessment can help local authorities and their partners to:

- develop strategy and plans according to need
- identify and work with community and health partners
- commission activities based on the best available evidence
- implement interventions to tackle inequity.

End-to-end pathway

The pathway from awareness raising and primary prevention, through diagnosis to treatment completion, incorporating all aspects such as contact tracing and other infection control mechanisms, for example, access to isolation facilities. This includes governance and commissioning considerations so that a comprehensive clinical and public health service is developed and delivered across any agreed geographical footprint.

Extrapulmonary TB

Active TB disease in any site other than the lungs or tracheobronchial tree.

Extensively drug-resistant TB

Resistance to at least isoniazid and rifampicin, 1 injectable agent (capreomycin, kanamycin or amikacin) and 1 fluoroquinolone.

High incidence

A high-incidence country or area has more than 40 cases of TB per 100,000 people per year. Public Health England lists high-incidence countries and areas of the UK on its website.

High-risk groups

The term 'high-risk groups' is used in this guideline to mean adults, young people and children from any ethnic background, regardless of migration status, who are at increased risk of having or contracting TB. This includes people classified as under-served, people identified as contacts according to the case finding recommendations, new entrants from high-incidence countries and people who are immunocompromised.

Homelessness

For the purposes of TB control, a broad and inclusive definition of homelessness has been adopted that incorporates overcrowded and substandard accommodation. It includes people:

- who share an enclosed air space with people at high risk of undetected active pulmonary TB (that is, people with a history of rough sleeping, hostel residence or substance misuse)
- without the means to securely store prescribed medication
- without private space in which to self-administer TB treatment
- without secure accommodation in which to rest and recuperate in safety and dignity for the full duration of planned treatment.

Immigration removal centres

Immigration removal centres are private or prison-run holding centres for migrants waiting to be accepted by, or deported from, the UK. Immigration removal centres are also known as immigration detention centres and pre-departure accommodation.

Immunocompromised

In this guideline, immunocompromised refers to a person who has a significantly impaired immune system. For instance, this may be because of prolonged corticosteroid use, tumour necrosis factor-alpha antagonists, antirejection therapy, immunosuppression-causing medication or comorbid states that affect the immune system, for example, HIV, chronic renal disease, many haematological and solid cancers, and diabetes.

Incident risk assessment

Assessment of risk of exposure to TB in a congregate setting to decide on the need for and extent of contact investigation. The risk assessment would take into consideration factors such as infectiousness of the index case, vulnerability of contacts to TB infection, length of contact with or exposure to an infectious case and the built environment (for example, size of the rooms, ventilation and overcrowding).

Index case

The initial person found to have TB, whose contacts are screened. The source of their infection may be found to be 1 of the contacts, but the person who presents first is regarded as the index case.

Induration

The firm skin reaction occurring after a tuberculin skin test to diagnose latent TB infection. It is measured, and the result used to determine whether the test result is classified as positive or negative. This guideline recommends a threshold of 5 mm for tuberculin skin test positivity.

Infectious TB

Active smear-positive pulmonary TB, that is with acid fast bacilli visible on microscopy. Active TB affecting other parts of the respiratory tract or oral cavity, though rare, is also considered infectious.

Isolation

An infection control measure in which people with infectious TB are kept away from others who may be at risk of infection. This guideline deals with 3 levels of isolation for infection control in hospital settings:

- negative pressure rooms, which have air pressure continuously or automatically measured, as defined by NHS Property Services
- single rooms that are not negative pressure but are vented to the outside of the building

- beds on a ward, for which no particular engineering standards are needed.

Lost to follow-up

People are defined as 'lost to follow-up' if they cannot be contacted within 10 working days of:

- their first missed outpatient appointment (if they are on self-administered treatment)
- their first missed directly observed therapy appointment (if they are on directly observed therapy).

Multidisciplinary TB teams

A team of professionals with a mix of skills to meet the needs of someone with TB who also has complex physical and psychosocial issues (that is, someone who is under-served). Team members will include a social worker, voluntary sector and local housing representatives, TB lead physician and nurse, a case manager, a pharmacist, an infectious disease doctor or consultant in communicable disease control or health protection, a peer supporter or advocate and a psychiatrist.

Multidrug-resistant TB

TB resistant to isoniazid and rifampicin, with or without any other resistance.

Negative pressure room

Used to isolate some patients known or suspected to have infectious TB. A negative pressure room is one where the air from the room is sucked out into dedicated ducting through a filter and into the outside air, at a distance from all other air intakes. The pressure should be 10 pascals below the ambient air pressure.

Neonates

Children aged 4 weeks or younger.

New entrant

Anyone coming to work or settle in the UK. This includes immigrants, refugees, asylum seekers, students and people on work permits. It also includes UK-born people, or UK citizens, re-entering the country after a prolonged stay in a high-incidence country.

Opportunistic case-finding

Opportunistic identification of people with active or latent TB using tests, examinations or other procedures in the course of existing appointments or interactions, rather than identification through formal screening programmes.

Outbreak

There is no robust, widely accepted threshold for an outbreak of a disease, but in practical terms an outbreak is the occurrence of an unusually high number of cases in associated people, in a small geographical area, or in a relatively short period of time.

Peers

Peers are people who may have experienced TB. They are often in a good position to help convey, with empathy, the need for testing or treatment. They may be recruited from specific populations. With support they can communicate health messages, assist with contact investigations or testing and offer people support while they are being tested or treated.

Prisons

Any state prison establishments, including young offender institutions.

Rapid access

In the context of TB services, rapid access refers to timely support from a specialist team.

Smear grade

The number of bacilli found in a sputum sample, believed to relate to the degree of

infectivity of the person. There are several systems but in general recording goes from no mycobacteria in 100 fields (0 or negative) to more than 10 acid-fast bacilli per field in at least 20 fields (grade 3).

Social contacts

Someone who has had contact with a person with infectious TB but has not been in prolonged, frequent or intense contact.

Substance misuse

Substance misuse is defined as intoxication by, or regular excessive consumption of or dependence on, psychoactive substances, leading to social, psychological, physical or legal problems. It includes problematic use of both legal and illegal drugs.

TB control board

A partnership of mixed professionals and lay people who have experience of leading, commissioning, managing or supporting people with TB. Board members are likely to include the voluntary sector, housing representatives, TB specialists and other clinicians, consultants in communicable disease control or health protection, peer supporter and advocate groups, clinical commissioning groups, executive officers, local government commissioners and an independent chair. This list is not intended to be exhaustive; membership should be determined based on an area's needs, agreements and commissioning arrangements.

Treatment interruption

A break in the prescribed anti-TB regimen for 2 weeks or more in the initial phase, or more than 20% of prescribed doses missed intermittently.

Under-served groups

This term is used in this guideline to mean groups of adults, young people and children from any ethnic background, regardless of migration status. They are 'under-served' if their social circumstances, language, culture or lifestyle (or those of their parents or carers) make it difficult to:

- recognise the clinical onset of TB
- access diagnostic and treatment services
- self-administer treatment (or, in the case of children and young people, have treatment administered by a parent or carer)
- attend regular appointments for clinical follow-up.

The groups classified as under-served in this guideline are:

- people who are homeless
- people who misuse substances
- prisoners
- vulnerable migrants.

Under-served children

Groups of children identified as potentially under served include:

- unaccompanied minors
- children whose parents are under served, including vulnerable migrants
- children whose parents are in prison or who abuse substances
- children from Gypsy and Traveller communities
- looked-after children.

Vulnerable migrants

Vulnerable migrants may include undocumented migrants and those with no recourse to public funds. Some refugees, asylum seekers and new entrants to the country may also fall into this category.

Young people

People aged 16 or 17.

Context

Tuberculosis (TB) is a curable infectious disease caused by a type of bacterium called *Mycobacterium tuberculosis* ('M. tuberculosis' or 'M.Tb'), or other bacterium in the M. tuberculosis complex (that is*, M. bovis* or *M. africanum*). It is spread by droplets containing the bacteria being coughed out by someone with infectious TB, and then being inhaled by other people.

The initial infection clears in over 80% of people but, in a few cases, a defensive barrier is built round the infection and the TB bacteria lie dormant. This is called latent TB; the person is not ill and is not infectious. If the immune system fails to build the defensive barrier, or the barrier fails later, latent TB can spread in the lung (pulmonary TB) or develop in the other parts of the body it has spread to (extrapulmonary TB). Only a small proportion of people with latent TB will develop symptoms ('active TB').

Many cases of TB can be prevented by public health measures and, when clinical disease does occur, most people can be cured if treated properly. Taking medication in the wrong dose or combination, irregularly or for too short a time can lead to drug resistance. Drug-resistant strains of TB are much harder to treat and significantly increase a person's risk of long-term complications or death. If left untreated, 1 person with active pulmonary TB may infect as many as 10 to 15 people every year.

TB incidence in the UK has increased since the early 1990s, but has remained relatively stable since 2005. Despite this, it remains high compared with many other western European countries. Cases tend to cluster in urban areas where populations of at-risk groups are high. These include areas with many people born in countries with a high incidence of TB, areas with a high level of homelessness, poor housing or poverty, and areas with high rates of problem drug use.

The NHS and Public Health England, as well as a local authority public health teams and many third sector organisations, have been working to reduce the harm caused by TB to many individuals and communities. TB is a notifiable disease, meaning that clinicians have a statutory duty to notify local authorities or a local Public Health England centre of suspected cases, and efforts have been made to strengthen services and ensure clear lines of accountability and responsibility. However, a stronger approach to TB control is now needed to build on this work. Indicators of TB incidence and TB treatment outcomes have been included in the Public Health Outcomes Framework. In addition, Public Health

England and NHS England have designed a collaborative tuberculosis strategy for England that brings together best practice in clinical care, social support and public health. Agencies at all levels, including national and local government, clinical commissioning groups and third sector partners, are committed to working in partnership to decrease the incidence of TB, fight the spread of drug-resistant forms of the disease, reduce current health inequality and, ultimately, eliminate TB as a public health problem in England.

Recommendations for research

The guideline committee has made the following recommendations for research. The guideline committee's full set of research recommendations is detailed in the full guideline.

1 Universal compared with risk-based approach to using rapid diagnostic tests

In people with suspected TB, what is the relative clinical and cost effectiveness of universal and risk-based use of rapid nucleic acid amplification tests?

Why this is important

The guideline committee noted that there were 2 possible approaches to using rapid nucleic acid amplification tests for suspected TB. The current approach is to use them only if TB is strongly suspected and rapid information about mycobacterial species would alter the person's care. Another approach is to use them in anyone with a possible diagnosis of TB. There is a trade-off between ensuring that all people with active TB are diagnosed and avoiding a large number of false positives, which leads to unnecessary treatment. This trade-off may lead to differences in the cost effectiveness of each approach. NICE's systematic review of the diagnosis of active TB did not identify any robust evidence on this, nor did the health technology assessment on using nucleic acid amplification tests to detect drug resistance. Cost-effectiveness studies are needed to improve understanding in this area.

2 Diagnosis in children

Apart from culture, what other diagnostic tests or combinations of tests are effective in establishing an accurate diagnosis of active respiratory TB in children and young people with suspected active TB?

Why this is important

The guideline committee noted the lack of evidence on the diagnosis of active TB in children. The disease manifests differently in children than in adults, and more evidence

would have been useful to the committee. Cross-sectional studies are needed to examine the relative accuracy of different tests, and the most appropriate specimen type for these tests, compared with tests currently in use. In particular, the poor accuracy of many tests in children means that diagnostic strategies that is, combinations of tests, should be investigated, including both tests with high sensitivity and tests based on host response.

3 Treating isoniazid-resistant TB

For isoniazid-resistant TB, what is the most effective regimen for reducing mortality and morbidity?

Why this is important

There is little evidence for the treatment of isoniazid resistant TB. This is the most common form of drug resistance in the UK, occurring in 7.5% of TB cases. Currently, treatment is not always successful, even when the recommended drugs are given for the recommended time and there are no adherence issues. It is particularly difficult to treat if there are treatment interruptions or if the central nervous system is involved. Randomised controlled trials are needed to compare different anti-TB regimens for isoniazid-resistant TB, assessing mortality, treatment success or treatment failure, rates of relapse and adverse events.

4 Impact of infection control measures on quality of life

What effects does isolation have on the quality of life of people being treated for TB?

Why this is important

Isolation is known to significantly affect a person's quality of life. Despite this, the guideline committee identified no reliable data on the impact of isolation on quality of life. This information is essential in producing economic models that reflect the real costs of isolation. Data on the impact of isolation on quality of life need to be collected and reported.

5 Treatment interruptions caused by adverse

events (specifically hepatotoxicity)

For people with active, drug susceptible TB who experience treatment interruptions because of adverse events, particularly hepatotoxicity, what approach to re-establishing treatment is most effective in reducing mortality and morbidity?

Why this is important

There is little evidence on re-establishing treatment after interruptions because of adverse events. This is key to ensuring treatment success without relapse or the emergence of drug resistance, but avoiding further adverse events is also important. Randomised controlled trials are needed to compare approaches to re-establishing treatment for active, drug susceptible TB after it is interrupted because of adverse events, particularly hepatotoxicity. These trials should assess mortality, treatment success or failure, rates of relapse, the recurrence of adverse events and the emergence of drug resistance. Approaches evaluated could compare, for example, restarting regimens with lengthening their duration, as well as sequential reintroduction. Approaches should vary depending on the proportion of doses missed and the stage of treatment (initial or continuation phase) in which the interruption occurred. Prospective observational cohort studies with multivariable analyses may also be useful.

Finding more information and committee details

To find NICE guidance on related topics, including guidance in development, see the NICE topic pages on tuberculosis and vulnerable groups.

For full details of the evidence and the guideline committee's discussions, see the full guideline. You can also find information about how the guideline was developed, including details of the committee.

NICE has produced tools and resources to help you put this guideline into practice. For general help and advice on putting our guidelines into practice, see resources to help you put NICE guidance into practice.

Update information

February 2024: We removed the final bullet of recommendation 1.1.3.10, which said 'have a family history of TB in the past 5 years', to align it with the chapter on tuberculosis in the Green Book.

September 2019: Minor wording changes have been made to recommendation 1.7.4.2 and footnotes added to reflect new restrictions and precautions for the use of fluoroquinolone antibiotics. It is labelled **[new 2016, amended 2019]**.

June 2019: Recommendation 1.6.1.8 has been amended to add in more detail about the meaning of contacts.

November 2018: Recommendation 1.1.3.16 on BCG vaccinations for healthcare workers and other NHS employees was updated after a surveillance review.

May 2016: Recommendation 1.2.1.1 was clarified to reflect the sequencing of tests. Reference to IGRA status was removed from recommendations 1.1.3.13; 1.1.3.16-18; 1.1.4.6; 1.1.4.8 and 1.6.1.4.

February 2016: Recommendation 1.1.3.4 has been amended to clarify that the recommendation is about assessing risk for and vaccinating the baby.

January 2016: This guideline was published. It is an update of NICE guideline CG117 (published March 2011) and replaces it. It also incorporates and adapts NICE guideline PH37 (published March 2012).

Through the scoping process we work with stakeholders to identify, prioritise and agree areas of the guideline to update. This means that areas outside the scope were not reviewed during this update and the recommendations may not reflect current practice. Areas that have not been reviewed in this update may be addressed 2 years after publication, when NICE next considers updating this guideline. NICE may undertake an update of discrete areas of the guideline if new and relevant evidence is published.

Recommendations are marked as:

- **[new 2016]** if the evidence has been reviewed and the recommendation has been

added or updated

- **[2016]** if the evidence has been reviewed but no change has been made to the recommended action
- **[2006]** if the evidence has not been reviewed since 2006
- **[2006, amended 2011]** or **[2011]** if the evidence has not been reviewed since 2006
- **[2012]** if the evidence has not been reviewed since 2012
- **[2006, amended 2011, amended 2016]** or **[2011, amended 2016]** if the evidence has not been reviewed since 2011, but either changes have been made to the recommendation wording that change the meaning or NICE has made editorial changes to the original wording to clarify the action to be taken (see below).
- **[2006, 2012, amended 2016]** or **[2012, amended 2016]** if the evidence has not been reviewed since 2012, but either changes have been made to the recommendation wording that change the meaning or NICE has made editorial changes to the original wording to clarify the action to be taken (see below).

Recommendations from NICE guideline CG117 that have been amended

Recommendations are labelled **[2011, amended 2016] and [2006, amended 2011, amended 2016]** if the evidence has not been reviewed but either:

- changes have been made to the recommendation wording that change the meaning, or
- NICE has made editorial changes to the original wording to clarify the action to be taken.

Further details of the specific changes to the recommendations during the 2016 update are available on request.

Recommendations from NICE guideline PH37 that have been amended

Recommendations are labelled **[2012, amended 2016]** if:

- The evidence has not been reviewed, but a change has been made to clarify roles or actions in the original recommendation, extrapolate to the whole population, or where

system changes such as establishment of TB control boards have been reflected

- NICE has made editorial changes to the wording to clarify the action to be taken, but where there is no change of meaning to the original recommendation.

Further details of the specific changes to the recommendations during the 2016 update are available on request.

Minor changes since publication

September 2024: We updated recommendation 1.7.4.2 to reflect the new safety advice on fluoroquinolones.

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